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NOTES

OF THE CAUSE

TRIED AT THE LIVERPOOL SUMMER ASSIZES,

BEFORE

MR. JUSTICE CRESSWELL AND A SPECIAL JURY,

AUGUST 27TH, 1845,

BETWEEN

W. E. NEWTON

AND THE

GRAND JUNCTION RAILWAY COMPANY,

FOR AN INFRINGEMENT OF LETTERS PATENT
FOR IMPROVEMENTS IN THE CONSTRUCTION OF BOXES FOR THE
AXLETREES OF LOCOMOTIVE ENGINES AND CARRIAGES,
AND FOR
THE BEARINGS OR JOURNALS OF MACHINERY IN GENERAL;
AND ALSO
FOR IMPROVEMENTS IN OILING OR LUBRICATING
THE SAME.

LONDON:
SMITH, ELDER AND Co., 65, CORNHILL.

1845.

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Inventor,

ISAAC BABBITT,

OF BOSTON, MASSACHUSETTS.

Sole Agents,

JOSEPH WOODS & Co.,

3, BARGE YARD CHAMBERS, BUCKLERSBURY, LONDON.

LITERARY & SCIENTIFIC
INSTITUTION.

LIVERPOOL SUMMER ASSIZES.

TUESDAY, AUGUST 26TH, 1845.

NEWTON

v.

THE GRAND JUNCTION RAILWAY COMPANY.

BEFORE MR. JUSTICE CRESSWELL,

AND A SPECIAL JURY.

Mr. Webster opened the pleadings.

Mr. Baines.—May it please your lordship. Gentlemen of the jury,—This is an action, as you have heard, for the infringement of a patent. The Defendants in this case are the Grand Junction Railway Company, the Plaintiff is a gentleman, a patent-agent in London, and the patent in question, as you heard from my learned friend, Mr. Webster, whose assistance I have here, is for "certain improvements in the construction of boxes for axles, or axletrees, of locomotive engines and carriages," and for the "bearings or journals of machinery in general." It is also for an improvement in oiling or lubricating the same; but as the only part of the invention we charge to be pirated is the first, it is that to which I propose, in the first instance, to confine your attention, namely, of the improvement in the construction of boxes for axles or axletrees of locomotive engines or carriages, and for the bearings or journals of machinery in general. The invention itself is admitted, in the patent, to be a communication from a foreigner, and that foreigner is a gentleman of the name of Mr. Isaac Babbitt, an engineer at Boston in the United States. The patent in question was sealed 15th May 1843, and the specification was enrolled, as is necessary, within six months after that time. My lord, I believe, has already before him a copy of the specification, which states the invention itself, the object of it, and the manner in which the proposed advantage is attained. This which I now hold in my hand, is what is called a step or bearing, and in this the axle or axletree of the locomotive works. Before the invention of the present patentee, it had been usual to have the hard metal, the brass, uncovered with anything else, and the consequence of that was, that the great velocity with which the railway-carriage or engine moved, had a very great tendency indeed to cause a heating or abrasion, which was found to be attended with very inconvenient, and sometimes even dangerous consequences, and it was therefore an object of first-rate importance in the construction of machinery of this kind, that there should be some means devised by which that evil of heating or abrasion to which I am now calling your attention, might be prevented. You will find such means have been devised by the author of the invention which is now before you. The specification itself will be put in by and by. It will be my object to explain to you, in as clear and popular a way as I can, what the substance of the invention is. I have stated to you what the object to be attained was, and it will be my business also to state to you the manner by which those objects are attained by means of this invention.

Gentlemen, Mr. Babbitt became aware that by the application, first of a lining of tin to the hard metal which is below, and in that way first preparing it by a coating of tin, and then by the placing upon that an alloy of metal, of which block tin was the basis, the very effect might be produced which it was the object to attain; that is to say, that the evil of heating and abrasion might be avoided, a very great saving effected in the consumption of oil, greater security to the whole machinery attained, and a much less wear and tear of the machinery occasioned altogether. So that you will find, I believe, by the evidence that I shall call before you, that there is accomplished now a saving of somewhere about two-thirds in the quantity of oil necessary, and of about one-sixth in the stock of engines that it is necessary to keep for the purpose of working any given railway. Of course, I do not pledge myself to the accuracy of these figures; but that there is very great advantage, indeed, both as to the saving in oil, and the saving of expense in working the railway, I undertake to make out to your perfect satisfaction by and by.

You will excuse me if I say a word or two more upon this subject. The manner in which this object is attained is, as I stated,. by taking first the bearing in that state which I may call its original state, where it is the hard metal—mere hard metal—putting upon that a coating of tin; and it is declared in the specification, that the invention may be applied to any metal which is of such a nature as to admit of being tinned. When that coating of tin has been put upon it, it is then prepared for receiving that lining of the alloy which I mentioned, and which is stated in the patent to be an alloy, of which block tin is the basis. A particular kind of alloy is mentioned in the specification, and recommended; but it is distinctly stated there that any alloy of which block tin is the basis, will answer the same purpose. This, which I now hold in my hand, is the state in which the bearing or step is when it comes from the hands of the patentee, or the inventor, the present patentee. (The learned counsel produced a model before the jury.) You observe here, there has been the coating of tin, you do not see that—that is under this, then above that is placed this alloy, which is one of those of which block tin is the basis. Gentlemen, in the specification it is also stated, and recommended by the patentee, that there should be used certain ledges, or fillets, which you may observe. You observe a kind of projection at each end and the top, that is recommended in the specification for the sake of keeping this softer metal, the alloy, in its proper place, making the whole as complete as possible. You observe it would have that effect. Here we have it in its complete state.

Mr. Justice Cresswell.—That fillet is of the same metal as the outer case?

Mr. Baines.—Yes, it is of the same metal as the outer case. Here it is in its complete state; and what we say is, that when it is brought into its complete state, that evil of heating and abrasion, which is so serious, is almost entirely prevented—certainly to a very great degree lessened, as you will hear from the evidence of the most eminent and experienced witnesses that this country can furnish on such a subject.

Gentlemen, the present Defendants seemed to have imagined, as you will see when I come to state what they have done by and by, that if they could use this without these ledges or fillets, they might do so with impunity, as if that were not a mere means recommended by the patentee of keeping this alloy in its place, and keeping the whole compact. But the substantial invention here, which must be clear to any one who reads the specification, (it will be read by and by,) is the application of this alloy as a lining to the harder metal prepared to receive it, by the coating of tin which I have just mentioned, that forming a kind of inner lining upon which the axletree works, so as to avoid the evil of heating and abrasion which I mentioned to you in the first instance.

Now, gentlemen, it is said here, that is one of the many defences put upon this record, and it is always a defence put forward by those who infringe a patent, that there is a want of novelty in this, and upon that ground they claim to be at liberty to do what they have done. I shall show you by the most eminent engineers in this country, and the most eminent machine makers in this country, that the application of this block tin, or of an alloy of which block tin is the basis, as a lining to the steps and bearings of machinery, for the purpose of avoiding heat and abrasion, is altogether new, and that it is entirely due to the present patentee, the author of the present invention. No doubt at all—no question in the world about this, that, before that time, common solder, which you know is a composition in which some tin finds a place, which has been used again and again for the purpose of repairing a temporar defect or anything of that kind—a workman not having the new brass stop at hand to put in, is content to patch up or tinker up the old one—to save his solder he would do it in that way; but for the purpose I have mentioned to you, of lining a new step or bearing, that new step or bearing being previously tinned in order to receive that lining, and to avoid the evil of heating and abrasion, I undertake to satisfy you this is an entirely new invention, and also one of the greatest possible utility. There cannot be greater proof of it than this, that down to the time of the present patent being taken out, the thing was altogether unused in railway machinery; and when one considers the able and eminent men who have been employed in constructing machinery of that kind, and how people have been for the last eight or ten years since railways have been so much in use, intent upon removing every cause of danger, and introducing every improvement into use in machinery of that kind, the simple fact that this had never been in any way whatsoever introduced into railway machinery in the way I have mentioned, before the present patent was taken out, is I think as nearly decisive as possible upon the subject of the novelty of the thing.

Now, with respect to the utility of it, as the present Defendants think, I will show you, under the hands of those who have written on the behalf of the present Defendants, that they have formally acknowledged its utility, and been willing enough to drive a bargain with the patentee if they could get it upon their own terms. They have ventured to put upon this record that it is not an invention of utility; I will call before you witnesses of the first distinction, engineers,—and I am perfectly certain my learned friend cannot meet their evidence,—who will tell you that this is an invention of the very first importance; in all those points of view which I have already spoken of, the evil to be counteracted being that heat and abrasion; if you get rid of that, you get rid of one considerable source of danger and delay, you get rid of a considerable source of expenditure of oil, which would otherwise be necessary, and get rid of a considerable source of expenditure in the actual number of engines that it is necessary to keep up, for the purpose of working any given line of railway.

Gentlemen, Mr. Isaac Babbitt, the inventor of this, came over to England to introduce his improvement in the August of the year 1843. The patent itself, as I have stated, was sealed on the 15th May 1843, and Mr. Babbitt, when he came to this country, in the first instance applied to the Liverpool and Manchester Railway Company—he gave them leave to use his improvement: these are facts I am going to bring home to the knowledge of the Defendants, and make strictly evidence against them; he gave them leave to use his improvement on two of their engines free of charge; he superintended the application of these improvements to the engines of the Liverpool and Manchester Railway Company at the works of that Company. I do not know whether you remember at that time the works of the Grand Junction Railway Company were within some fifty or one hundred yards, at Edge Hill, of those belonging to the Liverpool and Manchester Railway Company; their station, I believe, is now at Crewe. I believe they have still works there; at that time they certainly had. You will find that during the whole time when Mr. Babbitt was there, introducing and superintending the introduction of these improvements into the engines of the Liverpool and Manchester Railway Company, a person of the name of Marshall, who was a foreman of the Grand Junction Railway Company, the present Defendants, was constantly in and out, and a witness of the whole proceeding; he had full opportunity of seeing what Mr. Babbitt was doing, and what kind of improvements Mr. Babbitt was making upon the engines of the Liverpool and Manchester Railway Company. Those engines of the Liverpool and Manchester Railway Company underwent six weeks' trial; the result was the most satisfactory possible: then the Liverpool and Manchester Railway Company came to terms with Mr. Babbitt, and they have been constantly engaged ever since in applying those improvements to their machinery. All the locomotives on their line, as well as the other lines, are now provided with them, and a great part of the fixed machinery also. It will be proved to you the saving in oil, in repairs, and everything else I have mentioned, is immense.

In the year 1844, towards October 1844, or indeed earlier than that, certainly at that time, it was ascertained that the Grand Junction Railway Company were availing themselves of the principle of this invention, and reaping all the benefits from it which it was likely to give them. You will find they had introduced it into all their engines and carriages; what they had done was by way of evading this patent; they had not put the ledges, but instead of that, as a contrivance for keeping this alloy in its place, they had thinned the tin down, off to nothing; it had gone from thick to less thick, shaving it down, as it were, off to nothing; the thing being previously tinned in the way recommended in the specification of our patent. It was found they had done that which gave them most of the benefits of the invention, and they would have had them all if they had not had recourse to this clumsy contrivance for the purpose of evading the exact imitation of the patent. That is what is always done by people who imitate a patent. They do not do the thing to a hair's-breadth, it is not exactly the same thing, but it is a substantial imitation, with a variation which is to serve for an argument afterwards, if it is to come before a jury, by the patentee, when he claims compensation, and then he is to be told, Oh this is not an exact imitation of your article—just see, there is this difference.

The question is always whether there has not been, on the part of the Defendants, a substantial imitation of the article produced under the patent of Mr. Babbitt, whether the principle he has applied in this way has not been pirated by them, and that they have made a profit of his invention. I undertake to satisfy you that it is so. You will find they were since made aware of this invention by seeing what Mr. Babbitt was doing to the engines of the Liverpool and Manchester Railway Company in the way I have stated. They have been tinning both the new bearings and the old.

And now it will be my duty to state to you the correspondence which has passed between these parties upon the subject. I must call your particular attention to these—probably by reading the letters now, it will save the time of their being read hereafter. I shall think it my duty to call your attention to this correspondence.

The first letter is a letter on the 5th of October 1844, from Mr. Newton, the present Plaintiff, to Mark Huish, Esq., of the Grand Junction Railway Company; it is this:—"Sir, —I have been long aware that your officers have endeavoured to avail themselves of the advantages of a patent granted to me on the 15th May 1843, for improvements in the construction of boxes for the axles or axletrees of locomotive engines and carriages, and for the bearings of machinery in general, and also improvements in oiling and lubricating the same, by simply tinning the bearings instead of retaining the soft metal by ledges which, in my specification, is described as the most perfect mode of obtaining the desired object. I am aware, however, that some surfaces have lately been prepared on the plan recommended.

"Your mode of proceeding is a clear invasion of my patent, which will prove to a certain extent successful in saving a large portion of oil, and in keeping the bearings cool, but the advantages will fall short of what would have been experienced if you had adopted the entire improvement; and it subjects my interests to corresponding injury.

"I beg to mention that no permission to enter upon these experiments has been given either by myself or my agent, Mr. Joseph Woods, and that when he called on your Mr. Trevethick at Crewe, he examined several instances of the attempted invasion, and stated to Mr. Trevethick the nature of the infringement, wishing to enter into an amicable arrangement for conducting the experiments previous to negotiating terms. Mr. Trevethick, however, would not entertain any proposition, and referred him to your Board of Directors for redress, indicating at the same time a disposition to enter into litigation on the subject. Mr. Woods preferred a personal interview previous to my addressing you on the subject, and as he finds from you that the Board are disposed to treat the subject on its merits only, simple and defined as they may be, I beg you will inform them that I am quite willing to make an amicable arrangement for its further use on your line, provided they assent to negotiate for it immediately. Should they be disposed to abandon it, as you hinted might be the case, I shall feel myself compelled to apply for the damages sustained by its employment during the past year, calculated on the saving of oil and repairs effected by its introduction by other Companies in performing similar amount of duty. I shall feel obliged by your favouring me with an answer by this day week, and am yours obediently," &c.

Mr. Newton writes again on the 19th October:—" Inclosed I beg to hand you a copy of my letter of the 5th, and as time presses shall feel obliged by your favouring me with an immediate reply. I am, Sir, yours obediently," &c.

Then there is a letter from Captain Huish of the 21st of October:—" Sir, I have to apologize for not sooner attending to your letter. The fact is, that Mr. Trevethick is absent on leave, and will not be back for a week. So soon as he returns you shall hear from me. In the mean time I can assure you that the Directors will do only what is right. Yours obediently, Mark Huish."

Mr. Trevethick then writes to Mr. Newton on the 2nd of November, and says, " With reference to your letter of the 5th October, addressed to Mark Huish, Esq., I am desired to ask if you will favour me with a copy of your specification." Signed, F. Trevethick.

Mr. Newton writes back to Mr. Trevethick, and says, " I duly received your favour of the 2nd instant, desiring to have a copy of my specification for improvements in axle-boxes, &c., &c., for perusal, and which I now beg to hand you, and request you will favour me by returning it at your earliest convenience.

"I do not include the opinions of Mr. Webster and Messrs. Baxendale & Co., obtained for the Liverpool and Manchester Railway, as I doubt if you would be willing to take any as conclusive that had not been obtained by yourselves. I am yours obediently. P.S. I beg you will favour me with an early answer from your Board to the letter of 5th October, which I addressed to M. Huish, Esq."

Mr. Newton writes again to Captain Huish on the 10th

December. He says,—" In accordance with a request from Mr. Trevethick, I sent him a copy of my specification of the patent for lining the bearings, surfaces of machinery, &c., and a request that he would lose no time in returning it with an early answer from the Board of Directors to my former letters.

"I sent the copy on the 6th of November, and have received no further communication on the subject, which I consider extremely unhandsome; and I beg you will inform the Directors, that unless I have a full answer to my former letter at once, I shall be obliged to place the matter in the hands of my solicitor." Signed by Mr. Newton.

Then there is a letter from Captain Huish on the 11th December.—" Sir, I can assure you that the matter is not forgotten, or postponed. We have had one opinion on the case, which is quite conclusive in our favour, and are now obtaining another of a more practicable kind. We have no desire to delay this affair a single day, nor to take the slightest advantage of any doubtful point; and, should you prefer it, we are quite ready at once to leave the solicitors to deal with the case.

"You shall hear from me as soon as we obtain our opinion, and this I trust will be in a very few days."

Then on the 18th he writes again, and says,—" I now beg to inform you that further inquiries have satisfied the Directors that by their operations at Crewe, they have in no way infringed the patent you possess for the improvement in the construction of axle-boxes. They are, moreover, very doubtful of the utility of their present plan, and have some thought of reverting to the brass, as there does not appear to have been any saving effected in the oil.

"I am, however, desired to ask your terms for the full use of the patent claimed by you, when I will inform you of the final decision of the Directors." Signed by Captain Huish.

On the 21st of December Mr. Newton writes to the Directors,—" Gentlemen, I beg to acknowledge the receipt of your Mr. Huish's letter, of the 18th, stating a wish on your part to close an arrangement for the use of my patent, without referring the matter to a court of law. I am and have been all along quite willing to make an amicable arrangement, but am at the same time quite prepared to enforce my legal rights.

"Mr. Joseph Woods will be in Liverpool to direct the necessary modification for applying my improvements to the engines of the Dover Railway, now building by engineers in Lancashire, and I have directed him to make certain propositions to you, which, if agreed to in writing while he remains at Liverpool, I am willing to carry out; but such are without prejudice, if not acceded to, and my power of agency delegated to him only extends to negociations on my behalf, entered into during the said period. I am, Gentlemen, yours obediently, W. E. Newton."

Then there is a letter from Mr. Newton to Mark Huish, Esq., of the 27th December: "Sir, I am informed by my agent, Mr. Joseph Woods, that at his interview with you on Monday, you express your approbation of the proposal I authorised him to make, for settling our differences as to the employment of my patented invention, and that you require a written proposal to that effect.

"I would beg to call the attention of your Directors to the experiments already concluded on the Liverpool and Manchester Rail, the report on which, by their Mr. Booth, showed to you at his interview, I will proceed to copy."

Then there is a short report by Mr. Booth, which was sent in the inclosed. Then Mr. Booth says, "Dear Sir, I have much pleasure in complying with your request, to report to you officially upon the use of Babbitt's patent soft metal bearings in the locomotive engines of this company;" that is, the Liverpool and Manchester Railway Company. "In the last twelve months we have introduced the improved metal steps and oiling apparatus upon twenty-four locomotive engines, and the first result has been a very important saving in the consumption of oil, to the extent of full fifty per cent. in the passenger engines, and upwards of twenty-five per cent. in the heavy luggage engines. The slow speed, irregular work, and long hours of these latter engines, and being principally night work, may cause more consumption from waste, and therefore admit of less proportionate saving to arise from any improvements in the oiling apparatus or rubbing surfaces.

"But the peculiar recommendation of the patent bearings is, that the rubbing surfaces appear to have hardly any perceptible wear; some of the engines have run 20,000 miles, whilst the bearings (what are generally called the brasses of the main connecting rods) continue apparently unchanged; the cotters not having been struck down. I am very happy therefore to report that our experience so far of Babbitt's patent improvement is very satisfactory. I remain, dear sir, yours, Henry Booth." Then Mr. Newton goes on with his letter, and says, "In addition to this, I am prepared to prove that your officers did not use the mode whereby you are infringing my patent, previous to August 1843; that bearings constantly heating at that time were perfectly cured by the process, and ran some 4,000 to 6,000 miles without further adjustment, and that the consumption in your crank axle passenger engines, of oil, has diminished since that time at least fifty per cent., and the goods engine nearly in the same proportion. That your officers have attempted an imperfect imitation of my plan in a carriage which failed on the Birmingham line, by reason of the soft metal filling up the grease hole, and stopping the supply of lubricating material, and causing the same to melt, and eventually to break the axle, whereby much damage has been done to my interests, in depreciating the value in the opinion of other purchasers. Taking these circumstances into consideration, the completeness of evidence I have prepared as to the extent of employment, and the firm opinion of the first patent-law barristers of the day, that your proceedings are within the terms of counterfeiting and imitating, or making addition to and subtraction from the invention, which are the prohibiting words of the letters patent; taking, I say, all these into consideration, I feel confident that a jury would award me ample damages from so wealthy a Company as yours. I have however always wished to steer clear of legal quarrels, and excepting that a decision in this case would support and confirm my claim and position with the public, I have no desire to go into court. I will make you the following proposition, in order to enable you to try fairly the advantages of my invention when adopted in its full integrity, viz.—I will grant you a license on receipt of the sum of £60, to put in practice my invention on three of your engines and tenders, to be fitted up under the inspection and to the entire satisfaction of my agent, Mr. Joseph Woods, within two months from the date of the agreement to accept this proposal, and to be put to work in competition with three other engines fitted in all respects according to the mode employed previous to the grant of my patent; and further, that within four months from the date of your acceptance, you shall determine to come to terms of agreement as to the application on all your engines, or abandon it, and pay to me a fair equivalent for the damage I have sustained by your infringement. This offer I can hold open for a week only, from this date, and am yours obediently, W. E. Newton."

Then there is an answer to that from Captain Huish on the 1st January.—" Sir, your letter of the 27th December has been taken into consideration by the Grand Junction Company, and I am desired to inform you that they cannot accede to the terms contained in your communication.

" They are quite prepared to prove that they have in no degree infringed your patent, and that they are now employing a process in tinning their axle-boxes, which has been practised by men at present in their employ for fifteen years.

" From the reports, also, that have been made to them from the superintendent of their locomotive department, it appears that little or no saving in oil has been effected by the tinning. The Directors have examined the returns of about twenty engines, ten with axle-boxes coated with tin, and ten with brass only, and they find little or no difference in the relative expenditures of oil. It is plain, therefore, that even admitting, for the sake of argument, your exclusive right, it would be quite out of the Directors' power to agree to the very high estimate which you are pleased to place upon the invention, as in no case has the saving in oil between the brass and the tin been more than £4 per annum.

" Under these circumstances, it might be sufficient for the Directors simply to decline your offer; but they are quite ready to admit that you have improved upon the process, and have produced a very useful article, and I am therefore desired to say, that without in any way admitting the infringement with which you charge them, or indeed acknowledging the validity of the patent itself, they are ready to make an arrangement with you on terms which, if agreeable to yourself, I am prepared to communicate.—Yours, Mark Huish."

To that Mr. Newton replies:—"Gentlemen, Referring to the letter of your Mr. Huish, of the 1st January, I regret that the very liberal offer I made you in my last letter has been declined. I should not have made it at all, but for the assent expressed by your Mr. Huish, to the same proposal made verbally by my agent, Mr. Woods; and I can only account for your having declined it, by supposing that you entertain an idea expressed by Mr. Trevethick to Mr. Woods, that the terms of my offer only permitted a limited use of the invention on the three engines; and if that should be the case, I beg to explain, that my offer referred to the use of the invention in these three engines for the remaining unexpired term of the patent.

"I beg to observe, that you appear to pass entirely, *sub silentio,* the main point of value of this improvement, which is the decrease of wear and tear, of cost of repairs, and of pulling to pieces and re-erecting the engines; and to such an extent does this obtain, that the adoption of the improvement on thirty engines fitted with common bearings, and calculating six engines and tenders at £1,500 each, we claim for you a saving of £9,000 original outlay, or, at 5 per cent., £450 per annum on every thirty-six engines, as formerly required for the same duty, and which is additional to the saving in repairs, and oil.

"If you are willing to make a proposal which will meet the question at issue, I should be extremely uncourteous to refuse it, after the terms of approbation in which you have spoken of the improvement; but I of course cannot say how far it will meet my view until after being acquainted with, and having duly considered, its nature. I am, Gentlemen, yours obediently, W. E. Newton."

Then we have this letter of the 22nd January, from Captain Huish:—"Sir, I have laid your letter, under date the

10th January, before the Directors, and am desired to reply to it.

"I must first correct a very singular error into which you appear to have fallen, with regard to myself. So far from informing your agent that I assented in any way to your proposal, I acquainted him with my own views of the matter, which are totally dissimilar to yours. I certainly said, that if you made an offer, it would be my duty to submit it to the Directors, and I have accordingly done so.

"The Directors have again considered the whole matter, and are quite confirmed in the views they formerly expressed through me. They cannot therefore, in any way, acknowledge your claim to disturb them in their present mode of carrying on their repairs, and they do not acknowledge the validity of your patent, as applied to any system in use in their works. At the same time, the Board would be glad to try the precise axle-box which you forwarded, and they are willing to give you £200 for the free right to use it for any or all their engines should they hereafter feel inclined so to do." To that, Mr. Newton replies:—"I beg to acknowledge the receipt of your favour of the 22nd January duly, and have been delayed in sending you an answer by great press of business, and the consideration necessary for coming to a determination on the subject.

"I am sorry that Mr. Woods should have misunderstood your communication to him on the subject. At his last interview, he understood you to express that the matter was placed entirely in your hands to deal with, and that you fully approved the terms he proposed, and, for my part, I may add, that circumstance only induced me to make it in writing.

"It appears that your Directors object to making any large payment for an improvement apparently ideal, and which would require time for adoption; and, in that view of the case, I beg to propose a modification of the arrangement which, while it diminishes my just remuneration for the benefit which you will derive, has the merit of leaving you at liberty to abandon the application in further instances, or to extend just as extensively or quietly as you desire. I, therefore, beg you to inform your Board that I am willing to accept their offer, on condition of their entering into an agreement, by letter, to pay the sum of £200, as proposed, and to purchase from me, or my accredited agents, all the metals or alloys required and used for the purpose of my improvements, at the rate of 18*d.* per lb., excepting as regards the oiling and wicks. Trusting that this moderate offer of arrangement may meet their speedy approval, I am, Sir, yours, &c., W. E. Newton."

A gentleman of the name of George Palmer writes from the secretary's office, and says:—"I beg to acknowledge the receipt of your letter of the 8th instant, which shall be laid before Captain Huish immediately on his return to Liverpool." Nothing more is heard until the 23rd of April, and not, indeed, then. Then my client thought it his duty to put his case into the hands of his solicitors, Baxendale, Tatham, Upton, and Johnson, of Great Winchester Street, who write from their place, on the 23rd of April, and say: "Sir, Mr. Joseph Woods, on behalf of Mr. W. E. Newton, has placed in our hands the correspondence which for some months past has been going on between you and the latter gentleman, relative to the patent for 'Improvement in the Construction of Boxes for the Axles or Axletrees of the Locomotive Engines and Carriages, and for the bearings of Machinery in general,' and also improvements in oiling and lubricating the same.

"The object in placing this correspondence in our hands is to bring it to a close.

"The proposal made in Mr. Newton's letter to you of the 8th ultimo, and acknowledged by Mr. George Palmer, in his note of the 11th, when taken in connection with your previous letter to Mr. Newton of the 2nd January, is of so reasonable a nature that we do not doubt the intention of the Directors to accept it; but as the delay is prejudicial, we beg the favour of your early attention to the matter. We are, Sir, your obedient servants, Baxendale, Tatham, Upton, and Johnson."

Captain Huish writes back to them:—"I am favoured with your letter, and will lay it before the meeting of our

Locomotive Committee—I have no doubt the matter of Mr. Newton's claim will be satisfactorily disposed of."

Then, on the 15th May, Baxendale and Company write again, and say:—"We were favoured with your letter of the 24th ult., and although we are well aware how much your time is occupied at this period of the year, we shall be glad if you will bring the arrangement relative to Mr. Newton's patent to a close. We are, Sir, your most obedient servants, Baxendale and Company."

Then Mr. George Palmer writes from the Grand Junction Works, and says:—"Gentlemen, I am desired by the Directors of the Grand Junction Company to acquaint you, in reply to your letter of the 15th instant, that they are willing to adhere to their offer made to Mr. Newton on the 22nd January last, of £200 for the free right to use that gentleman's patent for any or all engines, should they hereafter feel inclined so to do; but they are not prepared to bind themselves to purchase from him or his accredited agents, all the metals that may be required for the purpose."

Baxendale and Company write back, and say:—"We received Mr. Palmer's letter of the 16th instant, and regret that the Directors should have refused the reasonable offer made to them by the patentee. Our instructions now are, to commence an action against the Grand Junction Railway Company for an infringement of Mr. Newton's patent, and we will send process to Messrs. Clay and Swift in a day or two."

In that way terminated this correspondence.

Now that correspondence, I apprehend, you will think is extremely material on this question in the cause. You will see, so far from their considering, as they profess to do by their pleading to-day, the invention of Mr. Babbitt as useless, as not possessing any utility whatever—for that is what they say on the record to-day—it is acknowledged it is useful; and all that they are endeavouring to come to agree about at the time of this correspondence, and through it, is, as to the terms on which they shall be permitted to use their invention, confessedly useful in itself. That is what they say distinctly. Yet, among their other defences, do not forget they actually put on that record that this invention is of no public utility whatever. I am sorry to say it shows how reckless they are in the kind of defence put forward here, and how prepared they are to take advantage of every chance of defeating the just claims of my clients, by putting forward defences which, under their own hands, I shall show can have no foundation whatever in point of fact.

I shall show you what I have already stated with respect to the novelty and utility of this invention. I shall show you the manner in which it is proposed to be worked. I shall call before you the first engineers of the country, Mr. Robert Stephenson, Mr. Cubitt, and a variety of others, who will prove they have introduced it upon the lines with which they are connected. They think it is a first-rate invention of the first-rate importance, that it is entirely new in this country. I shall call before you machine-makers of the first eminence in this country; they will prove it is of vast importance, they will tell you what is their experience on the subject. I trust, without being obliged to trouble you with a vast body of evidence, but at the same time not leave the case short with a view to the interest of my client and justice of the case, that I shall be able to satisfy you this is an invention, to the benefit of which, the fruits of which, my client is entitled under his patent, and that these gentlemen, the Defendants, ought to pay substantial damages for the infringement of that of which they have been guilty.

Mr. Martin.—We will put in the patent if you please, dated the 15th May, in the 6th year of our reign. The patent is for an invention communicated to the patentee by a foreigner residing abroad, an invention with certain improvements.

Mr. Justice Cresswell.—The patent is not in issue.

Mr. Martin.—It is necessary to put it in, for it may be necessary for the purpose of giving a title to the patentee. And there is the specification, it is enrolled the 15th November.

The Associate.—"Now, know ye, that in compliance with the said proviso, I, the said William Edward Newton, do hereby declare that the nature of the said invention, and the manner in which the same is to be performed, are particularly described and ascertained in and by the following description thereof, reference being had to the drawings hereunto annexed, and to the letters and figures marked thereon. That is to say, this invention, which has been communicated to me from a certain foreigner, residing abroad, consists first of certain improvements in the manner of making or constructing the boxes within which the gudgeons, or journals of machinery of various kinds, and particularly the axles of railroad cars of locomotive engines, and of other cars and carriages, are to run; and those improvements are applicable not only to boxes for axles, or gudgeons, which are divided so as to form semi-cylinders, but also to boxes, bearings, or sockets, that are not divided, and which form a continuous circle, and also to sockets which are square, or of any other desired form, and within which a rod or bar is to slide; as for example, the guide-rods used in locomotive and other steam-engines: second, an improved method of constructing oil-boxes, for oiling the axles of locomotive steam engines, cars, and other vehicles; and of combining the same with the lower boxes, within which such gudgeons or axles are to run. The boxes in which the gudgeons or axles are to run, are to be formed and prepared in the ordinary way of those which are to be received into the housings, or plummer blocks, of locomotive engines, cars, and other machinery, they being made of brass, bell-metal, or any other metal or metallic compound which has sufficient strength, and is capable of receiving a coating of tin: the inner parts of these boxes are to be lined with any of the harder kinds of metallic compounds, or alloys, known under the names of Britannia metal, or pewter; and of which compounds, or alloys, block tin is the basis. An excellent compound or alloy for this purpose may be prepared by taking about fifty parts of tin, five of antimony, and one of copper; but other compounds, or alloys, analogous in character, may be used. To prepare the boxes for this composition, they are to be cast with projecting rims, or fillets, along their interior edges, and on their ends, within their semi-cylindrical parts, or on the ends only of the boxes, or sockets, when they are not divided. The interior of these boxes, and the ledges, fillets, or rims, above named, are then to be cleaned and tinned in the usual way of performing that operation. A cylindrical or semi-cylindrical core of the exact size (in its cylindrical part) of the gudgeon, or axle, which is to run within the bearing, or of such shape and dimensions as may be necessary for the sockets of a slide, or of the stem of a valve, is then to be taken, and upon such core the box to be lined is to be placed in such manner as that the core shall coincide within the situation that the axle, or gudgeon slide, or stem, is to occupy within such box when in use. The boxes are to be of such size as that, when the core is so placed, it shall not touch, but shall be nearly in contact with the projecting rims, or fillets; its distance therefrom may be about the thirty-second part of an inch, more or less. The ends of the boxes are then to be closed by any suitable means, so that the interior shall form a mould to receive the lining of composition, metal or alloy which is to be fused and poured into it, a proper aperture being prepared for that purpose. This aperture, in the boxes for railroad cars and locomotive engines, may consist of a hole, an inch more or less in diameter, left through their middles in the act of casting them; and in all cases the opening may be so proportioned as to suit the size of the box that is to be lined. The metallic composition, when melted and poured into the box which has been prepared by being tinned, will unite firmly with its interior, and will cover the edges of the rims, or fillets, so as to prevent contact between them and the gudgeons, axle, slides, or stems, which they are to receive, whilst the ledges will at the same time effectually prevent any tendency in the composition, metal, or alloy, to spread, from the weight or friction of the load, or the motion of a slide or stem. In boxes thus prepared, the heating and abrasion which are so apt to occur in boxes so ordinarily constructed, do not take place, and their durability is consequently increased."

Mr. Martin.—I do not know that any benefit would arise from reading the figures—it seems very plain.

Mr. S. Wortley.—Go on there a little bit further: begin "In boxes thus prepared."

The Associate.—" In boxes thus prepared, the heating and abrasion which are so apt to occur in boxes so ordinarily constructed do not take place, and their durability is consequently increased. In the accompanying drawing, figures 1 and 2——"

Mr. S. Wortley.—Pass over that until you come to the claim.

The Associate.—" By the employment of the metallic alloy in sheaves and other articles of this description, and the substitution of a hard compound metal of copper and tin for the iron boxes, and for the iron pins or axles upon which the sheaves are to run, the injurious consequences frequently resulting from the oxidation of the iron are obviated, such sheaves always turning freely on their pins or axles, whilst, when made of iron, they are often obstructed and sometimes set fast from the cause above named. I claim as the first part of the invention, which is secured to me by the hereinbefore in part recited letters patent, making or constructing the boxes within which the journals or axles of machinery are to run, or within which the rods of slides or the stems of valves and other analogous parts of machinery are to slide, by providing them with rims or fillets along their edges and at their ends, or at their ends only, according to the nature and form of the box, in the manner and for the purpose herein set forth, and lining such boxes, prepared in such or a similar manner, with a metallic composition or alloy, of which tin is the basis, for the purpose herein fully made known and described. Instead of employing rims or fillets for the purpose of holding or retaining the metallic compound or alloy, other methods, such as making knobs, projections or holes may be adopted. I do not therefore intend to confine myself to the precise manner in which the invention is carried into effect: it is evident that the mode may be varied, without departing from the nature of the invention."

Mr. Martin.—The second part is a thing not in dispute, further than to give general evidence of it: it relates to this thing playing on the bottom.

MR. WILLIAM FOTHERGILL SWORN.

Examined by Mr. Martin.

Q. Are you foreman to Messrs. Sharpe, Brothers and Company, engineers, at Manchester?

A. Yes.

Q. (*By Mr. Justice Cresswell.*) Was that formerly Sharpe, Roberts and Company?

A. Yes.

Q. (*By Mr. Martin.*) Are they engineers in very large business?

A. Yes.

Q. And of very high character, I believe?

A. I believe they are.

Q. Very largely employed in the manufacture of locomotive engines for railroads?

A. Yes.

Q. And for how many years have you been in their employ?

A. I have been about nineteen years in the late firm of Sharpe, Roberts and Company, and about two years in the employment of Sharpe, Brothers and Company.

Q. Their business was the same, they were engineers, both the other firm and the present firm?

A. Yes.

Q. And I believe from the first introduction of locomotives until now, were employed in the manufacture of them?

A. Yes.

Q. You can explain to the jury what was the former mode of preparing gudgeons and bearings of locomotive engines?

A. Yes.

Q. We understand that the wheels of locomotive engines are attached to the axles?

A. They are.

Q. And that there is a part called the box or bearing, which plays upon the gudgeon which supports the carriage?

A. There is.

Q. If that is to represent the axle or the gudgeon of the wheel, this would represent the box, or the bearing which is laid upon it?

A. Yes.

Mr. Justice Cresswell.—It goes round it; there is the under part, too, to support it?

Mr. Martin.—I believe not, my lord.—(To the witness.) Generally speaking, does it go round it altogether, or is it merely semicircular?

A. Merely semicircular.

Q. There is, I suppose, something below; but the operating part, bearing the carriages and for working, is semicircular?

A. It is laid upon the top of it; it supports the weight of the engine or carriage, or whatever it may be.

Q. Now these, I believe, previous to the introduction of this patent, were made of brass, generally speaking?

A. They were.

Q. The gudgeon of iron, and the bearing or box of brass?

A. Yes.

Q. Was that the manner generally?

A. That was almost the universal plan.

Q. Now, with the brass and the iron, was the great speed at which railway carriages went, likely to produce heat, abrasion—what do you call it—getting warm?

A. Getting warm, and wearing the brass away; some term it getting warm, some abrasion, others some other terms.

Q. In point of fact, was the brass liable to be very quickly worn away, and very frequently?

A. Very frequently.

Q. And, I believe, the repairs of the brass boxes, or bearings, were a very considerable item in the expense?

A. A very considerable item indeed.

Q. Is the consumption of oil, also, very great?

A. Generally so, on account of being required to prevent the heating and the wearing of the brass.

Q. And were the repairs of this bearing, and the supply of oil, both matters of very great expense indeed to the railway Companies, and persons using those engines?

A. It was of first-rate importance that some other system should be introduced, in order to avoid the immense wear and tear.

Q. And I suppose the same observation would apply to all machinery where brass and iron were made to go with great velocity, approximating to each other?

A. Just so.

Q. Has your attention been called to the specification and patent taken out by Mr. Newton?

A. I have read the specification.

Q. And made yourself acquainted with it?

A. Yes, perfectly so, I think.

Q. Does it specify, with clearness and precision, the mode in which that operation is to be performed?

A. I fully understand it, and I consider it very simple and plain, and with such I could construct boxes of that description from reading the specification, and from the instruction therein afforded.

Q. And, in your judgment, would any workman of intelligence be also able to learn from that the mode of carrying that invention into operation?

A. Yes; I consider that any workman, of ordinary skill, would be able to construct this bearing according to the instruction afforded in the specification.

Q. Does that represent a bearing as cast from brass originally, with the ledges upon it, as described in that specification?—(A model was handed to the witness.)

A. I consider this is what is described in the specification.

Mr. S. Wortley.—That is the one without the lining?

Mr. Martin.—That is the one without the lining at all.—(To the witness.) The next step in that process is cleansing it and causing a coat of tin to be put upon it?

A. Yes.

Q. I suppose, for the purpose of tinning any metal, it is necessary the metal should be cleaned?

A. Yes.

Q. Take it into your hand, and explain it.

A. Perhaps I can better do it with this one. When it leaves the sand, as it is first cast, there is an oxidation on the surface of it, which requires to be removed, in order that the surface may be laid hold of by the tin—that chemical affinity may take place, and the two metals unite. Sometimes one plan is adopted for that purpose, sometimes another. For instance, if we take this and clean it with a file, and rub that scale off, then we employ a solution of sal-ammoniac and water, and rub it over; it will then receive the tin.

Q. (*By Mr. Justice Cresswell.*) I suppose the art of tinning brass and copper has been understood a great many years?

A. Yes.

Q. It is the same thing in substance?

A. It is just the same thing; sometimes sulphuric acid is used, just to remove it in the ordinary way.

Q. (*By Mr. Martin.*) Then the first step that is described is tinning the bearing or box as it is exhibited there?

A. Yes, according to the specification, this is the next step in the process.

Q. Having attained that process, I think the next step is to get the core or heart, I suppose, of the precise size of the gudgeon intended to run in it?

A. Yes; I should presume that was one—in that way (pointing to the model)—that is now ready to receive the alloy—the compound.

Q. You put it there (describing it)?

A. This is placed that way upon the plan, then the alloy is poured in through this hole, as described in the specification.

Q. Is that the article, the bearing, fit for use, the alloy being put on (handing it to the witness)?

A. I should consider this is one of the finished bearings.

Q. (*By Mr. Justice Cresswell.*) That is poured in, in the liquid state?

A. That is poured in, in the liquid state; then the form of the core gives the exact size of the journal that is to revolve in this bearing.

Q. Gudgeon and journal mean the same thing?

A. Identically the same, with only this difference—we generally take the journal in an iron axle to be the part that revolves round; this rests upon it. A gudgeon we generally considered to be a piece of iron that is inserted at one end into a piece of wood; the old millwrights generally resorted to that.

Q. If it runs in the middle, you call it a journal?

A. Yes.

Q. (*By Mr. Justice Cresswell.*) Is the tin of any great use to make the alloy adhere to it?

A. I should think it is essential to a certain extent; if you will allow me, I will explain it.

Q. It unites with the tin better, then?

A. When this is poured in, it unites with the tin, then this forms a solid mass.

Q. Would it unite with the brass, if poured in?

A. No.

Q. (*By Mr. Martin.*) Then, in your judgment, the employment of the tin is beneficial; the tinning first is beneficial?

A. Decidedly so.

Mr. Justice Cresswell.—It is necessary to accomplish it?

Q. (*By Mr. Martin.*) I think you have got a section of it in your hand?

A. Here is a section; I consider this is a section; it shows how the whole are united together.

Q. Firmly together, in one mass?

A. Yes.—(It was handed to Mr. S. Wortley.)

Q. When did you first hear of this invention?

A. I cannot speak as to the time:—it is only a short time ago.

Q. Since 1843, I believe?

A. Since that period.

Q. Has it been introduced in the engines manufactured by Messrs. Sharpe?

A. No, not that I am aware of.

Q. Have you known it has been introduced by Railway Companies?

A. I have known it has been introduced by Railway Companies; it may be in some of our engines after they have left the establishment.

Q. Have you at all ascertained whether or not it is an improvement?

A. Yes; a short time ago, when I heard of its being applied, I made application to the Liverpool and Manchester

Railway Company establishment at this end of the line, in order to allow me to look at some of the journals that had been in operation, and I examined the journals of an engine called the Kingfisher, and found they were in the best condition of any engine I had ever seen in my life.

Q. Last July was it?

A. If I recollect right, I think it was. The day I examined that engine was in July; it was the very day, rather a memorable day, when the Great Britain arrived in Liverpool. I believe that was the day.

Q. Did you ascertain how many miles those wheels had run without any repairs?

A. I made a memorandum in my pocket-book.

Q. (*By Mr. S. Wortley.*) Did you ascertain that from your own experiments?

A. I made no experiment, I merely called at the establishment.

Q. And got the information from the men?

A. Yes; the information I obtained I solicited from the Company's books, being a matter of interest and importance to us.

Mr. S. Wortley.—You cannot give that in evidence.

Mr. Martin.—We may be able to prove it from the Company's books, I apprehend.—(To the witness.) You found it was in the very best condition you ever saw?

A. Yes; I think it had run upwards of 26,000 miles.

Mr. Justice Cresswell.—No: but we cannot hear that.—(To the witness.) How many miles do your engines generally run without requiring repairs to the journals, or the boxes?

A. They vary very much.

Q. A good one—a likely one?

A. Perhaps they may run half as much as that, some of them considerably less.

Q. I have not got your former number; it was not legitimate evidence.

A. Perhaps they may vary all the way from 2,000 or 4,000 up to 8,000 or 10,000; but there may be other parties who have had more experience in the working of engines, who may give you better evidence on that.

Q. (*By Mr. Martin.*) Would 8,000 or 10,000 be a considerable number of miles for one of the old brass bearings to run without repair?

A. I think it would.

Q. But I believe the average is a great deal less?

A. I believe it is, from the best information I have.

Q. I ask you, in your judgment is the application of this tin to this bearing, an improvement?

A. I consider it a decided improvement.

Q. And I believe a valuable one?

A. A valuable one I consider also.

Q. Can you tell me what effect it has upon the heating?

A. I believe it entirely destroys the tendency to heat and abrasion.

Q. (*By Mr. S. Wortley.*) Do you know that entirely from your own knowledge?

A. Yes.

Q. You have had an opportunity of seeing it?

A. I have seen the engines at work, and felt the axis as I came along.

Q. (*By Mr. Martin.*) I suppose in all locomotive engines, especially in those very fast trains that are now run, it is a matter of very great consequence?

A. I should consider it of very great consequence indeed.

Q. Can you at all tell us whether there is a great saving in oil?

A. That has been intimated to me; I presume your lordship will have the same objection about that evidence.

Q. (*By Mr. Justice Cresswell.*) Yes, unless you know it practically; I suppose, generally speaking, where there is not a tendency to heat you will not want so much oil?

A. Just so.

Q. (*By Mr. Martin.*) I think you say the bearings of the locomotive engine you found in the very best condition you ever saw?

A. Yes.

Q. I believe your attention has been called to the improvement in oiling—is that an improved mode of oiling?

A. Yes.

Mr. Justice Cresswell.—No question is made about that.

Mr. S. Wortley.—No my lord, we do not say anything of the sort.

Mr. Martin.—I do not say you do.

Mr. Justice Cresswell.—The whole is put in issue as to that.

Cross-examined by Mr. S. Wortley.

Q. Is either Mr. Roberts or Mr. Sharpe here?

A. I believe Mr. Roberts is here.

Q. Just take that model into your hand; in the invention you have been speaking of, that process of making it forms a beautiful level surface?

A. Very level, as level as possible; in fact it dispenses with the boring out the steps; in the brass steps it is required, after they have been cast, to be bored out.

Q. That is a sort of polishing?

A. Yes; in order to get them to the exact size to fit the axle.

Mr. Justice Cresswell.—Like the boring of a gun-barrel.

Q. (*By Mr. Wortley.*) Then there is a great merit in that?

A. I should consider it was one part of it; not the principal merit.

Q. It is a great merit?

A. Decidedly.

Q. And another great merit is, preventing the metal from spreading, as described in the specification?

A. Yes.

Q. (*By Mr. Justice Cresswell.*) That is the merit of the outer case?

A. I presume your lordship refers to the fillets, or ledges.

Mr. Justice Cresswell.—No; that is the merit of the outer case, that it prevents the metal from spreading?

Mr. S. Wortley.—Oh yes; I mean it is a merit in the invention, that it should not spread.—(To the witness.) That is one of the merits of the invention, taking it altogether, that it checks the tendency to spread?

A. I have not had sufficient opportunities of examining whether the metals would spread, provided these ledges were removed.

Q. You say you have made yourself acquainted with the specification; you find it there stated, it is contrived for that purpose. Do not you consider it one of the merits of the invention?

A. Certainly, it is beneficial in that respect.

Q. There is nothing new in that particular alloy?

A. I cannot speak as to the particular nature of the alloy, there are so many.

Q. Alloys of block tin are very common?

A. Alloys of block tin are very common.

Q. Is pewter an alloy of block tin?

A. I believe it is.

Q. An alloy of which block tin is the basis?

A. I believe it is.

Q. Have you known tin introduced into the bearings in Messrs. Sharpe and Roberts's machines sometimes?

A. I have known it being introduced in the case of expediency.

Q. (*By Mr. Justice Cresswell.*) What do you mean by the case of expediency?

A. Well, my lord, it sometimes happens that in our own establishment some of the brass bearings may have worn considerably, I mean the bearing of the shafting; and it is necessary that they should be repaired, generally speaking, during the night season, when the works are standing: it has been found frequently that the shaft could not be got out of its place, and a new brass put in by the time that the engine was required to commence work in the morning; and in that case, the workmen have resorted to the following plan—that is, they have lifted the shaft up, or brought it to its proper place, they have secured the ends of the old step, or bearing, with pieces of wood and clay, then they have got a pan, and melted some block tin and lead, or lead by itself, whichever was at hand, or block tin by itself, and poured it in underneath the shaft, in order to form a bed to rest upon.

Q. (*By Mr. S. Wortley.*) That, I believe, has been frequently done in the steps and bearings of Messrs. Sharpe and Roberts's establishment?

A. It has been done occasionally.

Q. And in many other manufactories in Manchester?

A. I cannot speak as to other manufactories, but I know it is a mode resorted to, in order to accomplish the object I have referred to. But if there had been time to have taken the shaft out, and introduce a new brass step, the brass step would have been introduced, in preference to pouring in that lead, so far as my experience goes.

Q. When introduced, they have been allowed to remain there permanently?

A. Yes, until any opportunity has presented itself; any holiday-time that we could put in a brass.

Q. Do you remember any instance of putting in a mere new brass step, in the place of one which had been so altered, without removing more of the machinery?

A. I cannot call any particular instance to my recollection.

Q. I believe, one of the causes of the wear and tear in journals or gudgeons, as they call them, in steps, is their not fitting perfectly, is it not?

A. That is not exactly one of the causes; the great cause originally arises through the great amount of power required to turn the machinery, and then the opposite point on which the action comes generally wears away. In order to explain myself, suppose my arm represents the shaft, and there is a wheel upon the end of it, then, at the other end of this shaft, there is a strap or anything else coming, it pulls in that direction; the power applied at this end has a tendency to force the shaft in that direction. Suppose this was the bearing that the shaft lies upon, it would not be worn uniformly down, but be worn off at a tangent on the one side.

Q. That is not exactly an answer to my question. I was asking whether the wear and tear in bearings of that sort do not increase as the machinery ceases to fit well.

A. It increases certainly, on account of the liability of the shaft to work to and fro.

Q. In other words, that sort of bearing not fitting well is one of the causes of the wear and tear?

A. Yes, that is one of the causes.

Q. Now, whatever the object was with which that lead and tin were run in, in Messrs. Roberts's work, would it not have the effect of making the gudgeon run easier?

A. Certainly it would have the tendency of making it run easier, with less heat, for this reason—because the shaft would not then be in danger of twisting or tortion; it would be in a parallel line, and consequently would not require so great an amount of power to turn it.

Q. Do not you also agree with the patentee, the journal coming in contact with a softer metal has less tendency to heat than when it comes in contact in rapid motion with the brass?

A. We have found by experience, where we have introduced solid block-tin steps, they have answered our purpose in the way we required, but we have never introduced the tin for the accomplishing of the object in the way that you have spoken of.

Q. (*By Mr. Justice Cresswell.*) You have used solid block-tin steps, have you?

A. Yes.

Mr. S. Wortley.—Not for that object.

Q. (*By Mr. Justice Cresswell.*) Has the introduction of them diminished the wearing and the tendency to heat?

A. It has.

Q. Now, the socket—that which you have in your hand—is new in form, is it not?

A. It is new in form.

Q. The object and only effect of it being to retain the metal?

A. That is the intention of the patentee, I presume.

Q. That is the effect of it, is it not?

A. Yes, it is a double safeguard, so to speak, in addition to the soldering uniting them together.

Q. The soldering would have no effect in preventing the extension of the upper surface—the spreading of the upper surface?

A. It would all depend on circumstances.

Q. The soldering merely makes the junction perfect between the under surface and the brass?

A. The question would be, whether the weight of the engine entirely resting upon it would be sufficient to cause it to ooze out.

Q. (*By Mr. Justice Cresswell.*) That, you say, you do not practically know?

A. No, because I have never seen it.

Q. (*By Mr. S. Wortley.*) Now, is there any merit in these flanges, which I understand to be the portion of metal turned over the rims; there is a fillet runs across the end?

A. It is not only the ends, it is round the side also.

Q. Do you agree there is a merit also in that flange turning the metal for the fillet round about the rebate or fillet, or reveal, I believe you call it; do you see what I mean?

A. Yes, I see what you mean; it gives additional strength, allows more of the alloy to be poured into that cavity, consequently it affords a greater basis to meet the resistance.

Q. The process you have described is very common?

A. The tinning process is a common process.

Q. As well for the purpose you have mentioned, taking off the oxidation, is it not done for the purpose of filling up crevices and things, before you lay on another metal?

A. Yes, it is resorted to when circumstances require it.

Q. It is done by hand?

A. Yes, or dipped into a pan, or by means of a soldering iron.

Q. Do you remember Mr. Roberts sending any engines to the Dublin and Kingstown Railway?

A. Yes, I do.

Q. About ten years ago?

A. I believe it to be about that time.

Q. Had they not tin axle-boxes?

A. Solid ones, not lined ones, that I remember; I cannot exactly speak positively, but I believe they were solid.

Mr. Justice Cresswell.—They had solid tin boxes?

Q. (*By Mr. S. Wortley.*) That is, the journals run in tin?

A. Yes.

Q. Would that have the effect of diminishing the heat, as compared with brass?

A. It would have the effect, if the alloy that was used was sufficient to resist the action and the weight of the engine upon the tin.

Q. Then it was an alloy of tin, was it?

A. An alloy.

Q. Not pure tin, but an alloy of tin?

A. I believe it was an alloy, to the best of my recollection.

Q. An alloy of which block tin was the basis?

A. Yes.

Re-examined by Mr. Martin.

Q. The repairs you have spoken of were made when the interior of the bearing had got a good deal worn, the workmen who were employed were in the habit of putting this in to repair them?

A. Just so.

Q. You never adopted any plan like that in Messrs. Sharpe's works?

A. No, we never adopted a plan like this—such as tinning a step uniting them together, or having fillets; we merely resorted to it as an expedient in the way I have stated.

Q. When you had an opportunity, you resorted to the old mode of having the brass?

A. Yes.

Q. I believe those that you sent to Dublin were *solid* tin?

A. Yes; I believe they were.

Q. Like that?—(Handing a model to the witness.)

A. Something of that kind.

Q. I believe it was found it was quite unable to bear the weight of the locomotive engine?

A. I believe it was at that time.

Q. (*By Mr. S. Wortley.*) Do you know that of your own knowledge?

A. I have heard the observation made.

Q. (*By Mr. Justice Cresswell.*) Did they ever come back to you?

A. I do not know that they did, it is such a length of time.

Q. Did you ever make any more of them?

A. I do not remember.

Q. You do not recollect making another?

A. I had not much to do with locomotives at that time; I had some little, being sent out by Mr. Roberts occasionally.

Q. (*By Mr. Martin.*) In your judgment, would a bearing of tin be at all adequate to support the great weight of a locomotive engine?

A. Not as they were constructed at the time; that is the reason why I consider that to be a decided improvement.

Q. Does the circumstance of being able to use tin in this fashion attached to the brass, render this a great improvement in your judgment?

A. Decidedly.

Q. You have all the merits of this patent?

Mr. S. Wortley.—Do not sum up the merits of your patent.

Mr. Martin. I think I ought to sum up.

The Witness.—If you will allow me, there is another point in this case that may have been overlooked, arising from the questions asked; there is not only the abrasion to prevent the heat and so forth in the interior, but the clip that goes over this, or the slip in which it has to move up and down, requires a hard substantial surface, in order that it may be clipped firmly, and be prevented from wearing off; it is prevented from wearing in here—it should also be prevented from getting loose at the outer surface, and the bell metal or brass gives us that advantage.

Q. (*By Mr. Martin.*) This is the thing you call the clip?—(Pointing to the model.)

A. Yes, pressing on that.

Q. That would be the way it would be in an engine?

A. Yes; just in that way.

Q. Does that represent the clip and the thing itself?—(Handing a model to the witness.)

Mr. Justice Cresswell.—What does he say?

Mr. Martin. He says there is a benefit arising from it.

Mr. S. Wortley.—Let him say it himself.

The Witness.—There is this additional benefit, that the outside of the step should be of hard material, so that when it is secured into this bedding here it should be prevented from getting loose, as well as the inside from the wearing or heating, and thus cause the destruction of the brass in the way that has been alluded to; then the oiling parts are below—there is nothing resting on that, merely the oil conveyed, and the axle is fed from it.

Q. The oil is put in from a place near the side?

A. This is the outside appearance, this the inside, where the axle goes in.

Q. (*By Mr. S. Wortley.*) They were new engines which were sent to Dublin, were they not?

A. Yes.

MR. WILLIAM FAIRBAIRN SWORN.

Examined by Mr. Adolphus.

Q. Are you an engineer and machine-maker, at Manchester?

A. I am.

Q. In a very extensive business, I believe?

A. Yes; rather extensive.

Q. Have you been long acquainted with the construction of locomotive engines?

A. Yes, I have; from the commencement up to the present time, more or less, I have been acquainted with them.

Q. Has your attention been called to the plan of lining the bearing with tin or alloy of tin?

A. Just recently.

Q. How long is it since your attention was first called to it?

A. Two or three days ago.

Q. At that time, was the plan new to you?

A. Quite so: I had heard of the plan some weeks since, but never saw it before; but my attention was directed to it three or four days ago.

Q. Before that time, had you ever seen it in use?

A. No, I had not.

Q. Have you attended to it as an improvement in machinery?

A. I have read over the specification.

Q. (*By Mr. Justice Cresswell.*) What is your judgment about it?

A. I think it is perfectly new as far as my knowledge extends, I have never seen or heard of the lining of brass.

Q. What do you think of its merits?

A. I think it good, but I have not had much experience in it.

Q. (*By Mr. Adolphus.*) I need not ask you whether you have used it in your own works?

A. I have not: I have used block tin steps and different alloys of tin, but they have been always in a solid state.

Cross-examined by Mr. S. Wortley.

Q. In what is it that you say consists the novelty?

A. I think the novelty consists chiefly in the lining having an outer case of harder material—a harder metal and running in this alloy.

Q. In running in the alloy by way of a lining?

A. Yes.

Q. To a harder exterior?

A. Yes, and also its application?

Q. Stop a moment—also its application, what do you mean by its application?

A. Applying it to journals of axles and shafts, which to me is perfectly new.

Q. Then you had never heard of its being applied to journals for any purpose?

A. Oh yes, I have applied myself a similar alloy, but in a solid state.

Q. But you never heard of its being used for journals in the state of a lining run in?

A. No, not until lately.

Q. Therefore it is on that supposition, or that that had not been done, that you consider that a novelty?

A. It was quite new to me.

Q. You spoke of the application—do you mean the purpose for which it is applied, that that is new?

A. Yes, I mean its being applied to locomotive engines and to railway carriages, or to any other journal supporting heavy weights in that shape.

Q. You conceived that to be new, did you?

A. Yes, I think so.

Q. You are not speaking merely of the purpose to which it was applied, but of the manner in which it was applied?

A. Yes, and also the purpose. I mean the purpose at the same time.

Q. That is what I want to know, whether you are drawing any such distinction as was drawn by the other witness: do you mean to say that you consider the purpose to which it is applied in these engines is new, or that you consider the application of the bearing in the shape of a lining is new?

A. I think the purpose to which it is applied is a new one, so far as regards the softer materials.

Q. Does the novelty consist in the purpose for which it is applied, namely, preventing a heating, or in the mode of its application, that is, its application to a bearing?

A. In my mind it does—not with regard to the prevention of heat, for it was known before.

Q. That an alloy of this description would prevent the heat?

A. Yes, in many cases.

Q. In iron journals—and used before, was it not?

A. In the way I have described I believe it was in the solid state.

Q. And in the shape of lining too, was it not?

A. Not to my knowledge. I have had considerable experience, but I never knew it used as a lining before.

Q. Just look at that—(handing a model to the witness). What is the difference between that and a lining upon a hard substance?

A. This is certainly a piece put in, no doubt.

Q. It is a lining, is it not, upon a hard substance?

A. Yes; I would call it a lining, no doubt of it.

Q. (*By Mr. Justice Cresswell.*) Is it united to what is outside—to the outer case?

A. It is a piece fitted in.

Q. (*By Mr. S. Wortley.*) Just look at it again, and see if it is not entirely united, evidently run in upon a tinned surface.

A. I should certainly know that; I should think not. I do not think the metals are incorporated at all; certainly not.

Q. Will you give your reasons,—do you see any interstice?

A. Because it is I think loose now.—(The model was handed to Mr. S. Wortley.)—I should question very much whether that metal is incorporated.

Q. Will you now just reconsider that if you please.—(The model was handed back to the witness.)

A. It appeared to me it was so, and I also think it could be knocked out.

Q. Is there not a much greater interstice between the lining and the hard substance of the one they put into Mr. Fothergill's hand, than the one you have got now?

A. This appears to be better done than this one.

Q. Do not you see a larger interstice there between the metal that is run in, and the outer surface, which does not appear here?

A. I believe not; there is a corner here.

Q. Let me point out the place.—(Mr. S. Wortley showed the witness the part.)—Is there any interstice, or any such apparent flaw?

A. It appears to me in this corner it is not incorporated with the brass.

Q. I suppose you have abandoned your theory of its being loose?

A. No; I have not.

Q. Is it loose?

A. I think it would not be difficult to punch it out?

Q. I dare say it would be easy to punch the other out, for that matter.

A. I am not quite sure we could unite materials of that sort without a certain degree of temperature; how that was done, I do not know.

Q. Has that been applied?

A. Yes; this seems to be much firmer. It is cut through the tinning in this case.

Q. (*By Mr. Justice Cresswell.*) What do you mean by it is cut through?

A. The journal is wearing on the tin.

Q. Oh, something is wearing on the tin?

A. Yes; it is gone quite through.

Q. Your judgment is, I am to take it, that that one was applied and not run in—the one that I showed you?

A. I do not say it was not run in. I do not think it is well done.

Q. Suppose it is run in,—what is the difference between it and the lining of the patentees?

A. As to its effects, certainly none.

Q. What is the difference between it?

A. There is no difference, as I conceive. I do not say the patentee's is perfect with regard to its incorporation with the metal; but from what I have seen there, I should say the patentee's is rather better done than what that is in the union of the two metals.

Q. But that there is no other difference?

A. No; I think not.

Re-examined by Mr. Baines.

Q. You are speaking of the union of the two metals, in the specimens you have here?

A. Yes.

Q. How long have you been a machine-maker?

A. Thirty years.

Q. At Manchester?

A. Yes.

Q. Besides having great experience yourself, have you made it your business to get acquainted with improvements in machinery, as they have taken place?

A. Generally so.

MR. ROBERT STEVENSON SWORN.

Examined by Mr. Webster.

Q. I believe you are the engineer of the London and Birmingham Railway?

A. Yes.

Q. The South Eastern and North Eastern?

A. Yes.

Q. You have also had, I believe, considerable experience in the manufacture of locomotive engines?

A. Yes; I have.

Q. And extensive acquaintance with machinery?

A. Yes, I have.

Q. Has your attention been called to this invention of Mr. Babbitt, in Mr. Newton's patent?

A. Yes; it was some time ago.

Q. Have you seen the specification?

A. Yes; I have.

Q. Did you hear the account Mr. Fothergill gave, as to the tin lining, and the metal being put upon it?

A. Yes; I did.

Q. Do you agree with him in the account he gave of that being the invention described in the specification?

A. I do.

Q. Some questions were asked respecting the fillet; what would be the effect of a thin coating of metal upon it in preventing the spreading?

A. I believe if the coating were thin enough, if it were a thin coating—that the fact of the process of tinning being used in the first instance, thereby producing chemical union, the extension by pressure would not take place. I consider the fillets useful, or at least the use is more apparent when the thickness of tin is considerable.

Q. Do you think, if the tin is thinned, they may be dispensed with altogether?

A. I think so entirely.

Q. Would a box which had a thin coating of tin and the other metal upon it, in your opinion, be an improvement of the kind described in the specification of Mr. Babbitt?

A. Not an improvement; it would be the same thing.

Q. I mean an improvement on boxes of the same kind as that described in the specification of Mr. Babbitt?

A. Oh, quite.

Q. I understand you to say it would be the same thing?

A. Yes.

Q. (*By Mr. Justice Cresswell.*) What I understand Mr. Stephenson to say is, if you kept the lining thinner, it would still be a lining—the same material; it would still be a lining, but might not require the fillet; it would have the same effect of preventing heat; it would not spread, because it would not have enough to spread: that is what I understand to be the substance.

Q. (*By Mr. Webster.*) I believe you were consulted as to the introduction of this on the South Eastern Railway?

A. Yes, I was, about eight months ago.

Q. I believe you recommended them to adopt it?

A. Yes, I did.

Q. How many engines was it to be adapted to?

A. I specified for twenty-eight new engines, and recommended the adaptation of the patentee's plan.

Mr. S. Wortley.—I do not see how this is at all important.

Mr. Baines.—There is one plea that this is of no use.

Mr. S. Wortley.—I do not see how this is important—how many engines this gentleman advised them to order.

Mr. Justice Cresswell.—No; the question is, what they did, and how they used them; you have put in a plea—it is of no use.

Q. (*By Mr. Webster.*) Do you know what they were to pay for it?

A. Five hundred guineas.

Mr. Justice Cresswell.—Never mind what they were to pay for it; they might pay for a thing which was of no use.

Mr. Martin.—Was it worth the money?

Mr. Justice Cresswell.—I do not know; does he know whether they have worked well?—that is the question.

The Witness.—There are some working well now.

Q. (*By Mr. Webster.*) The question was asked as to the distance which an engine would run which had not boxes upon this plan; can you give any information upon that point?

A. Yes; from my experience, I think 8,000 or 10,000 miles for the brasses, at the connecting rod ends, is above an average, but they are very irregular.

Q. You say, 8,000 or 10,000 would be above an average?

A. I think it would.

Q. Can you speak as to your own experience, how many miles, engines of this kind would run?

A. Not from my own experience.

Q. Do you know they have run greater distances than that?

A. Before I recommended the adaptation of it on the South Eastern, I had examined bearings which had been in use.

Q. (*By Mr. Justice Cresswell.*) Which were represented to have been in use?

A. Yes; and also the certificates.

Mr. Justice Cresswell.—That I cannot take down.

Q. (*By Mr. Webster.*) With respect to the novelty of this invention, is it, according to your experience, a new invention?

A. I believe it to be entirely new.

Q. And useful?

A. I believe useful. I have not yet had sufficient experience of it to speak with very great confidence.

Q. Perhaps you can tell this: have you had experience enough to tell us whether that is a good useful axle? whether better than another, or not, is not to the purpose.

A. I believe it to be better.

Q. We do not ask for that; is it a good useful article?

A. It is a good useful article.

Mr. Justice Cresswell.—Because I apprehend, to make out that a patent article is better than any ever used before is unnecessary.

Cross-examined by Mr. S. Wortley.

Q. You say that the extension might be prevented if the coating of tin was thinner—have you seen the proposed thickness that the patentee uses?

A. Yes, I have; and do think it is desirable to apply this thickness in order to extend the time of wear.

Q. That is the very next question I was going to ask you: one of the advantages of the invention is the prevention of wear and tear?

A. Yes, so far as my knowledge goes.

Q. And the wear and tear and necessity for repair would be much more frequent if the tin was as thin as you describe?

A. Yes.

Q. In short, in order to be thin enough to prevent extension of the metal it must be very thin indeed?

A. It must be very thin; it would be considerably thicker, I think, than a mere tinning.

Q. Something about the thickness of a wafer, I suppose?

A. Yes, a little thicker than that, perhaps.

MR. THOMAS WILKINSON SWORN.

Examined by Mr. Baines.

Q. I believe you are foreman to Messrs. Bolton and Watt, of Soho Works?

A. In erecting engines.

Q. How long have you been in their service?

A. About forty-three years.

Q. I believe they are very extensive manufacturers of engines?

A. Very much so.

Q. Did you hear the invention in this case described by Mr. Fothergill, the first witness? Were you in Court when Mr. Fothergill was examined?

A. Yes.

Q. Is the invention of lining the steps and bearings of machinery with tin or an alloy of tin, new to you?

A. Quite new.

Q. Putting it on to a hard substance which has been previously tinned, putting an alloy of tin upon that, is to you quite a new invention?

A. Quite new: I never saw it.

Q. I believe you have had experience in going all over the country, erecting machinery?

A. Many parts.

Cross-examined by Mr. S. Wortley.

Q. What is it you say is new?

A. The alloying of the brass with an alloy.

Q. You are aware that alloy is very frequently poured into the bearings in machinery, are you not?

A. I never saw it done.

Q. Your business is in turning out new engines?

A. Yes; and repairing old ones.

Q. Steam engines?

A. Yes.

Q. Not locomotives?

A. No.

Q. Your attention is probably confined to steam engines alone?

A. Not altogether: I often see other works.

Q. You have never known the bearing of hard substance lined with an alloy in engines which you have made? Is that what you mean to say?

A. I never have.

Q. That is what you mean to say?

A. Yes.

Mr. Justice Cresswell.—I do not think he meant that.

Mr. S. Wortley. He accompanied it with very full and general words.

Re-examined by Mr. Baines.

Q. I think you say you have repaired engines, and also made new ones?

A. Yes.

Q. You have heard the question I put to you in the first instance, whether this method of lining a step which has been previously tinned with an alloy of this description is, in your judgment, new, so far as your knowledge goes?

A. It is new to me altogether.

MR. JOHN JONES SWORN.

Examined by Mr. Martin.

Q. Are you the managing partner of the Viaduct Foundry, near Newton?

A. I am.

Q. Have you had considerable experience in the manufacture and working of locomotive engines?

A. I have.

Q. From the time they have been introduced into use?

A. The last twelve years.

Q. I believe you have been contractors for the supply of locomotive power for different railways, and manufactured engines to a very considerable extent?

A. We have.

Q. Has your attention been called to this mode of manufacturing steps or bearings?

A. It has.

Q. As far as your experience goes, was it new on its introduction in 1843?

A. It was perfectly new.

Q. Did you ever see or hear of anything of the kind before?

A. No.

Q. I believe you are now manufacturing engines with bearings upon this principle?

A. I am.

Q. I do not know whether you yourself practically have made yourself master of it, or are able to form a judgment whether it is an useful thing or not.

A. I consider it a very useful one.

Q. Do you consider it an improvement?

A. I do.

Q. In point of prevention of heat? And what does the improvement consist of, in your judgment?

A. Principally the wear and tear of the machinery.

Q. I believe oil is a matter of great expense in working locomotive engines?

A. That is a question I cannot answer.

Cross-examined by Mr. S. Wortley.

Q. Locomotive engines themselves are comparatively new with other machinery?

A. They are.

Q. I understand you to say that the application of this to locomotive engines is, in your judgment, quite new?

A. It is.

Q. Are you not aware that in manufactories such as Sharpe and Roberts's, and others, an alloy of tin must frequently be run into the bearings for the purpose of supporting the journals?

A. I have heard it, but I have never seen it. I have never made use of it, and I have been in business twenty years myself, and been brought up to it.

Q. That is, you have never made use of it in manufacturing machines?

A. No, I never have.

Q. There is a journal in the lathe, a lathe for turning iron?

A. Yes.

Q. Do they generally run in brasses?

A. They do.

MR. GORDON CALLED.

Did not answer.

MR. JOHN HICK SWORN.

Examined by Mr. Adolphus.

Q. Are you an engineer?

A. Yes.

Q. And proprietor of the Soho Works at Bolton-le-Moor?

A. I am.

Q. Are you acquainted with the use of lining of soft metal to the bearings of engines?

A. I am.

Q. How long have you known it?

A. About a year and a half.

Q. Not before that?

A. Not before that.

Q. Are you now building any engines with bearings upon that plan?

A. Yes, I am.

Q. How many, and for whom?

A. Seven, for the South Eastern Railway Company.

Q. Under whose direction are you doing that?

A. Under the direction of Mr. Stephenson.

Q. Who was just now called?

A. Yes.

Q. Have you seen the bearings that are used upon the Liverpool and Manchester Railway?

A. Yes.

Q. Those are what have been described in the course of to-day?

A. Yes.

Q. Have you made experiments with such bearings?

A. I have not.

Q. In your judgment are they an useful contrivance?

A. I think so.

Q. Have you read the specification?

A. Yes, I have.

Mr. Justice Cresswell.—I do not think that seems to be disputed,—no question has been raised about that: in fact, it is so very simple, that the commonest artisan on reading that could do it.

Cross-examined by Mr. S. Wortley.

Q. Are you making them upon the plan of the patent?

A. Yes, we are.

Q. With the fillets?

A. Yes.

Q. You consider that an useful part of it, do you not?

A. Yes, I do.

Re-examined by Mr Baines.

Q. For what purpose is that useful—to keep it firm, I suppose?

A. To keep it firm, and prevent its being forced out.

MR. BENNETT WOODCROFT SWORN.

Examined by Mr. Webster.

Q. Are you a consulting engineer, at Manchester?

A. I am.

Q. I believe it is your business to make yourself acquainted with inventions?

A. It is.

Q. Has your attention been called to the metal steps which have been spoken of in court?

A. Yes, it has.

Q. Have you seen the specification?

A. I have.

Q. Do you agree with Mr. Fothergill, in the account he gives in the tinning and putting the other metal upon it?

A. Quite so.

Q. Was that in your opinion a new invention, at the time when this patent was taken out in 1843?

A I think it is, but I do not know much about steps.

Q. Had you ever known or seen metal bearings tinned first, and with a soft metal of tin or an alloy of tin laid upon them?

A. I never did—that was the first I ever saw.

Q. You say you do not know much about steps, and you say you have not known that sort of bearing used for any purpose whatever.

A. Never. I ought to have said steps to locomotive engines. I have had no experience in the steps of locomotive engines.

Q. I put it generally—to any machinery?

A. Never to any machinery.

Q. In your opinion as a practical engineer, is a lining of that kind an useful lining for the purpose?

A. I think it a very useful lining.

Q. To prevent the heating and abrasion?

A. I think it will.

Q. That is an important object of course to locomotive engines?

A. Yes.

Cross-examined by Mr. S. Wortley.

Q. I believe you are not so much a practical engineer as a consulting engineer?

A. I am both.

Q. Do you mean to say you have manufactured?

A. I have manufactured machinery to a considerable extent.

Q. How long ago?

A. I do it still—I am now.

Q. I think you say you do not know much about steps?

A. About the steps of locomotives: but other steps I know a good deal—general machinery.

MR. WILLIAM GLASGOW SWORN.

Examined by Mr. Baines.

Q. I believe you are an engineer, are you not?

A. Yes.

Q. How long have you been in business as such?

A. Thirty-five years.

Q. Were you a partner in the house of Galloway, Beaumont and Glasgow, engine-builders, at Manchester?

A. Yes.

Q. Has your attention been drawn to the method described in this specification, of tinning the hard step, then putting the alloy on afterwards?

A. I have not seen the specification.

Q. You have heard the description given by Mr. Fothergill?

A. Yes; I have not seen the specification.

Q. Was that new to you?

A. Yes.

Q. In your judgment, is that an useful invention?

A. Yes, it is.

Cross-examined by Mr. S. Wortley.

Q. You do not mean, Mr. Glasgow, that the process of tinning, for the purpose of joining an alloy with the hard metal, is new?

A. No, I do not.

Q. (*By Mr. Justice Cresswell.*) Tinning, for the purpose of joining a hard metal with a soft one, is not new, but as far as regards the principle of a metal, in the shape of a step, being put in, in the way in which that model is made, it keeps the tin in after it has got in?

A. Not new as far as regards the principle of the step; owing to the fillets being passed round the outside, it prevents the metal coming out.

Q. You think the fillets are new?

A. Yes.

Re-examined by Mr. Baines.

Q. You think they are useful?

A. Yes.

Q. What I want to know is, having first the hard step, then putting a coat of tin upon that, then a coat of alloy upon that, in the way you heard described by Mr. Fothergill, whether that is new?

A. Not the tinning.

Q. Not the tinning upon the hard step, but then the alloy upon that?

A. That is new.

Mr. Justice Cresswell.—Just attend; I do not understand you; see that we understand each other. I understood you to say, only a little while ago, the putting tin upon a hard metal, for the purpose of afterwards putting a soft metal upon the tinning, was not new.

A. The tinning, as far as regards the tinning of the step, is not new.

Q. Then the soft metal upon the tinning?

A. That is not new.

Q. Then we do not understand it. He says, first taking the hard metal, then tinning, then putting soft metal upon the tin, that is not new. For what purposes have you known that process adopted?

A. I have never seen it adopted.

Q. Have you ever known it used by anybody?

A. No.

Q. On any occasion?

A. No.

Q. Then how is it not new? I am afraid there is some confusion. You say, that using first a hard metal, then tinning that hard metal by the ordinary process of tinning, then uniting with it a soft metal, is not new?

A. Yes, it is not new.

Q. (*By Mr. Baines.*) The tinning is not new?

A. The tinning alone is not new.

Q. (*By Mr. Justice Cresswell.*) The tinning alone is not new?

A. No.

Mr. Justice Cresswell.—Everybody who has seen a kitchen utensil knows that is not new.

Mr. S. Wortley.—I understood Mr. Fothergill to say, that the soft metal could not adhere to the hard metal without the tin; therefore I think there is some mistake now.

Mr. Justice Cresswell.—Call him back, and take the examination yourself.

Mr. Glasgow re-called.

Q. (*By Mr. S. Wortley.*) Is not the process of tinning necessary for the purpose of welding, by fusion, the soft metal to the hard metal?

A. Yes.

Q. The process of joining soft metal to hard metal, by means of tinning, has been long since known, has it not?

A. Yes; the one is soldered by the soldering iron, the other is when the step is cast the metal is poured in; it is quite a different thing altogether.

Mr. Justice Cresswell.—What he means is, he has known two metals soldered together before, which I dare say will be admitted by everybody.

The Witness.—But this other is poured in.

Q. (*By Mr. Justice Cresswell.*) You have known metals soldered together before, but you never knew them run together in this manner?

A. No.

Mr. S. Wortley.—Let me understand; then the novelty, in your opinion, is the running it upon the tinning?

A. Yes, by a mould.

Q. But the process of spreading it by a soldering iron upon the tin is not new?

A. No. I never saw anything applied to axles, or anything of that description.

Mr. S. Wortley.—No, that is another question.

MR. MICHAEL ALLISON SWORN.

Examined by Mr. Martin.

Q. Are you the out-door foreman of the Liverpool and Manchester Railway Company?

A. Yes.

Q. Do you attend to the locomotive engines and sheds?

A. I do.

Q. And have you been in their employment for five years and a half?

A. I have.

Q. I need scarcely ask you, during that time you have become acquainted with all the parts of the machinery of a locomotive engine?

A. I have.

Q. Do you recollect the mode in which the bearing, or rather the steps, of your locomotive engine were made before Mr. Babbitt came to this country in 1843?

A. I do.

Q. How were they?

A. Our locomotive steps were made of brass.

Mr. Justice Cresswell.—Speak louder; there is no secret now.

The Witness.—It was used for the journals.

Q. (*By Mr. Martin.*) Brass alone?

A. Brass alone.

Q. Did it wear rapidly?

A. It did.

Q. Could you tell us at all what was the average number of miles one of these brass steps would run?

A. The connecting rod steps the brass would run; do you mean altogether, until worn out?

Q. I mean without repair.

A. It would run from 400 to 1,000 miles, without being taken down to be let together.

Q. The connecting rods are these, the rods of iron between the two wheels?

A. The connecting rods are what are connected with the crank axle of the locomotive.

Q. Which turn the wheels round?

A. Yes; this is one here.

Q. Just take it in your hand, and show it.—(It was handed to the witness.)—This is a connecting rod step?

A. Yes.

Q. You mean, the rod runs in the step?

A. This is placed over the journal; the step goes over this, and this forms the crank.

Q. That is the thing that moves the wheel round?

A. That moves the wheel round.

Q. For how many miles do you say that would run without repair?

A. From 400 to 1,000.

Q. I suppose there is very considerable wear upon that part of the engine?

A. There is; and very frequently those brasses want taking down. Some would run 100 miles. In many instances, they would be taken down once every second or third day, for heating purposes.

Q. Was it ever subject to heat, working at that rapid speed?

A. Very.

Q. And I suppose a great consumption of oil?

A. A great consumption of oil.

Q. Do you recollect Mr. Babbitt coming to this country in August 1843?

A. I do, well.

Q. Did the Company permit him to try experiments to introduce his improvements upon the Kingfisher, the Heron, and the Ostrich engines?

A. They did.

Q. Did you yourself see the introduction of his improvements upon these engines?

A. I did.

Q. I believe you cut down the old brass so as to give an opportunity of inserting this metal?

A. I did.

Q. Did you find it was an improvement?

A. I did.

Q. To a great extent?

A. So much so, that I had not to apply half the attention, not a tenth part of the attention.

Q. (*By Mr. Justice Cresswell.*) You mean that you had not to apply a tenth part of the attention?

A. I had not.

Q. Did you find the engines ran for a much longer time without the necessity for repair?

A. Yes; I did.

Q. I believe you have now introduced it universally?

A. We have.

Q. What is the average?

A. From 4,000 to 10,000 is about the average that the engine has run without the rods being let together. Some have run more, some less.

Q. (*By Mr. Justice Cresswell.*) That is since?

A. Since.

Q. (*By Mr. Martin.*) Do you also find the consumption of oil is diminished?

A. Yes; to a great extent.

Q. To what extent should you say?

A. From three quarts to one quart.

Q. A journey?

A. Per day.

Q. And it has diminished the use of oil to the extent of half?

A. To the extent of one-third.

Q. A saving of two-thirds?

A. Yes.

Q. Do the engines perform their work better, or as well as they formerly did?

A. Better.

Q. In your judgment, is the application of this invention a great improvement in your fast trains?

A. Yes.

Q. In your judgment, could you run the very fast trains, that are run now with the old brasses, at all.

A. I have never tried the experiment with anything of the sort, any further than that we have run upon our own line at the rate of forty-five miles an hour.

Q. (*By Mr. Justice Cresswell.*) The Liverpool and Manchester Railway Company do not send the express trains?

A. They do not.

Mr. Martin.—They send them pretty fast.

The Witness.—We have done fifty miles an hour, for short distances.

Q. (*By Mr. Justice Cresswell.*) In your judgment, is this a very great improvement?

A. Yes; it is. We have never had any tendency to heating at all, in any of those engines to which this has been applied; not on any part of the engine that I have noticed, except once.

Q. Had you a great deal of that before?

A. We had scarcely a day without it.

Q. (*By Mr. Martin.*) I suppose, in your judgment, it is a very great improvement indeed?

A. It is.

Q. A very valuable thing?

A. A very valuable thing.

Q. Had the Grand Junction Railway Company a workshop near where Mr. Babbitt was carrying this invention into practice?

A. Close to it.

Q. Was Mr. Marshall the foreman ?

A. He was.

Q. During the time that Mr. Babbitt was introducing this improvement, did he come into the place where Mr. Babbitt was working ?

A. I have never seen Mr. Marshall there myself.

Q. Has he made inquiries of you about it ?

A. He has.

Q. Have you been in the sheds where the work-places were, where the Grand Junction people were working upon their engines ?

A. I have, many a time.

Q. Now, about three months after Mr. Babbitt began to work at your place, did you see any connecting-rod, or brass lined with tin, in the possession of Mr. Marshall ?

A. I did once.

Q. What was he doing with them ?

A. The day I saw him with them, he was taking them to Crewe.

Mr. S. Wortley.—He cannot know that.

Q. (*By Mr. Martin.*) He had them with him as if going a journey ?

A. He had them at the station; he was upon the station as if going a journey—as if going to Crewe; he might not be going there for what I know.

Q. Were these brass things lined with tin, in the same manner as Mr. Babbitt's invention ?

A. They had been tinned—lined thickly with tin; but it was partly worn off.

Q. Then they had been used before—they had been in use ?

A. They had been in work.

Q. I believe you said nothing to him then ?

A. No.

Q. But, some time after that, you did make an observation ?

A. I did make an observation to him some days afterwards.

Q. Are you in the habit of being in their workshop-place from time to time, seeing their locomotive carriages and engines?

A. We sometimes do visit each other, from time to time.

Q. Can you tell me whether or not they are now using, universally, this mode of making their steps?

Mr. S. Wortley.—What mode—what he knows they use?

Q. (*By Mr. Martin.*) What is it?

A. The principle they work upon is simply this.

Q. (*By Mr. S. Wortley.*) Have you seen this yourself?

A. I have seen this myself. By washing the brass over with tin, and laying it as thick as they can on the bottom of the brass; that is what we call tinning, perhaps three-sixteenths, and from that to an eighth of an inch.

Q. (*By Mr. Martin.*) Washing over with tin; then they lay tin upon it, as much as they can get on?

A. Yes, that is the way I have seen them do it.

Q. Is that used by them in all their engines now?

A. I could not say that.

Q. To a great extent?

A. I have seen several that have been done with it.

Q. How long have you seen them in the habit of doing this?

A. I cannot recollect the time first when I went into the Grand Junction shed. Mr. Marshall himself showed me, in the Grand Junction shed, the mode in which he was doing them; I do not recollect the time at all, not the date.

Q. Some time ago: a year ago?

A. It is a year and a half ago, I dare say.

Q. Have you frequently, since that time, seen him engaged in the same operation?

Q. I have seen him several times.

A. About this Kingfisher engine: do you recollect Mr. Fothergill coming to see the Kingfisher engine; were you with him when he saw it—the same day when the Great Britain came here?

A. He was looking at it.

Q. Can you tell me how many thousand miles the Kingfisher engine had run without repair?

Mr. S. Wortley.—Of your own knowledge.

Q. (*By Mr. Martin.*) Of your own knowledge.

A. I should think she had run about 20,000 miles. I could not say that is the positive distance she had run; but, as near as I could guess, without looking at the books, or anything of the sort, for my information.

Q. From your knowledge of the time and extent to which that engine has been employed, you say it is 20,000 miles.

A. Yes.

Q. I suppose there are books kept at the office whereby the time during which each engine works can be ascertained.

A. Yes.

Q. (*By Mr. S. Wortley.*) Do you speak from these books?

A: No.

Mr. Justice Cresswell.—No; he says distinctly not.

Mr. S. Wortley.—I do not know why my learned friend speaks about books.

Mr. Justice Cresswell.—I suppose to offer them if necessary.

Q. (*By Mr. Martin.*) Did you see the thing itself? Was it in exceedingly good order after performing all that distance?

A. What; the journal?

Q. Yes.

A. Splendid order.

Q. Notwithstanding all that?

A. Yes.

Q. I suppose the lining can be replaced upon the old brass whenever necessary?

A. Oh, yes; when this is worn off, you can repeat it as often as you like.

Q. With great ease?

A. With great ease.

Cross-examined by Mr. S. Wortley.

Q. The one in the Kingfisher is on the same plan as the patentee's?

A. The same plan as one of those.

Q. It has the fillets?

A. Yes; it has.

Q. I dare say the metal has not spread at all?

A. It has not spread.

Q. Are all the engines to which you have applied it on your line fitted up in the same way?

A. In the same way.

Q. That is a great advantage; the metal not spreading in these boxes, is it not?

A. It is.

Q. And I suppose the thicker the metal is, the longer the thing will last?

A. Decidedly.

Q. It does not require even an engineer to tell us that. Now, as to those engines on which you have seen it applied on the Grand Junction Railway, there are very few to which it is applied at all, are there?

A. I do not know how many.

Q. How many can you speak to, of your own knowledge? that is all we have to do with. How many will you say you have seen with this application of this sort of metal?

A. If I said three or four, I should be within bounds.

Q. I believe they kept above 100?

A. I dare say they have about 100; they may have more; I cannot say exactly.

Q. Those to which you saw it applied were old engines, were not they?

A. They were. I beg your pardon, the engines to which it had been applied were new engines, some of them; they had not worked more than six months.

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Q. Not bran new?

A. As good as new after working six month

Q. I thought you told us, when you were describing about how badly the brasses worked, that they wore out very quickly: with the brasses, do you mean to say running constantly six months do not wear out brass?

A. Those engines I saw had been tinned previous to that; probably tinned when they first came out.

Q. Now you are conjecturing. Were not the engines you saw, with this sort of metal, engines that had been out at least six months?

A. They had, I dare say.

Q. When tinned, you do not know?

A. When I saw the brasses they were tinned at the side of the steps, and the bottom was worn off where the wearing part was, and they were repeated with the tinning again.

Q. When the bottom was worn off, the journals would not fit well?

A. Yes.

Q. What do you mean—would they?

A. When the weight of the carriage wears off the tin on the bottom side of these journals, by tinning again it does not prevent its fitting.

Q. What I want to know is, before it is tinned again it ceases to fit—it is necessary to tin it again?

A. The journal always wears it down, and finds its own bed.

Q. Then it does not fit, when it is worn down?

A. Yes; it still fits after that.

Q. The step is loose; it does not fit close all round to the journal when it is worn away?

A. Probably not all round; but the part where it works must—it fits well there.

Q. Wears down to the brass?

A. Yes.

Q. Then, when you saw them actually tinning, they were re-tinning work that had been worn away?

A. The tin had been worn off the brass.

Q. And you saw them re-tinning?

A. Yes.

Q. It was merely tin; I believe no alloy was in it?

A. It was laid on from one-sixteenth to an eighth thick.

Q. There was no alloy in it: it was simple block tin?

A. Simple block tin, I believe, so far as I could see.

Q. How were they putting the tin on when you saw them; how was it spread, was it with the soldering iron?

A. No; I do not think they used a soldering iron to it.

Q. How did you see it done?

A. The way I have seen it done there is, merely to tin the brass over the first thing, wash it over with tin, then get a stick of tin and lay it on as thick as they can at one place.

Q. Like a paint brush?

A. Yes; the brass was hot, and they just went over it as well as they could; and where they could not get it to lay level, I dare say they might use the soldering iron; but I never saw them use the soldering iron.

Q. There was no pouring into a mould, or anything of the kind?

A. No.

Q. No fillets?

A. No.

Q. Nothing to prevent its spreading?

A. No.

Q. It had, in point of fact, spread very greatly in those you saw worn?

A. What had spread?

Q. The tinning.

A. It had spread over the circle of the brass—that was all.

Q. But in those that had been actually worked and worn, the tin had spread since it had been put on?

A. It had worn off.

Q. I think you said there were no fillets?

A. No fillets.

Re-examined by Mr. Martin.

Q. It did not spread, in your judgment; but was worn off?

A. Worn off.

Q. I believe there are three engines—one is the Heron, the other the Crane, and the other the Ostrich; can you tell me, was that in use for two years?

Mr. S. Wortley.—You are asking about what I did not cross-examine to.

Mr. Martin.—I have this handed to me since (referring to a paper).—(To the witness.) Will you tell me how many miles the Crane has run?

A. I do not know exactly how many miles.

Q. About what?

A. 17,850.

Q. Without any repairs?

A. Without any repairs.

Q. Is the Ostrich the other one?

A. I think there is the Ostrich; I know by the first way we did them. That has run 32,000 miles without any repair; (referring to another,) that rod has never been taken down from the day it was put up for repair—never been touched.

MR. BENJAMIN LEWIS SWORN.

Examined by Mr. Adolphus.

Q. Are you foreman to Mr. Whitworth?

A. Yes.

Q. Is he a machine-maker at Manchester?

A Yes.

Q. Before that, were you a fitter in the service of the Defendants?

A. Yes.

Q. I believe you were first at Edge Hill, and afterwards at Crewe; is that so?

A. Yes.

Q. When did you go to them, and how long did you stay?

A. I entered the Grand Junction Company's service about the beginning of April 1840, and left, I think, on the 28th of June 1844.

Q. Do you remember the using tin lining to the bearings of the engines?

A. I do.

Q. When do you remember that being first done, and where?

A. The first time I saw the application of it was at Crewe; I think about August or September 1843, as near as I can remember. I cannot speak exactly to the dates.

Q. What steps was it applied to, old ones or new ones?

A. It was applied to both.

Q. Was any alteration made in the new steps, for the purpose of using it?

A. No; I believe not, with the exception, if I remember right, I could not speak positively, I think at the beginning it was bored a little larger.

Q. Do you mean by beginning, the time when they began to use this lining?

A. The time they put it on these new brasses, they bored them a little larger, to allow the tinning to be put in.

Q. Was there a man of the name of Thow there at that time?

A. Yes.

Q. Was he foreman?

A. Yes.

Q. Did you make any observation to him about the use of this lining?

A. I remember making an observation to him once.

Mr. S. Wortley.—I do not know whether any talk between this man and the foreman is admissible.

Mr. Adolphus.—I will not go on with that; it is of no consequence.—(To the witness.) Have you yourself fitted steps into the Defendants' engines and tenders?

A. Some in the engines, none in the tenders. I am wrong; I have done some in the tenders too. I remember once in the night assisting to do a tender.

Q. In the old ones, or new ones?

A. This was upon the old brass.

Q. Have you fitted new steps?

A. Yes.

Q. While you were at Crewe, did the Directors of the Company go over the works?

A. Frequently.

Q. How often?

A. Perhaps once a month; sometimes once a fortnight.

Q. Do you remember their seeing any of the steps there, on the new plan?

A. I do.

Q. When was that?

A. I cannot exactly speak to the date. I think it would be, perhaps, in October, or somewhere thereabouts. I could not say exactly. I remember the circumstance of seeing them.

Q. October, in what year?

A. In 1843.

Q. Where were the steps?

A. The steps were taken out of an engine, and laying aside for the purpose of the Directors to look at them.

Q. Did any of the Directors look at them?

A. Yes, all that were then present.

Q. Was there a foreman of the name of Allen there at that time?

A. Yes.

Q. Did he say anything to the Directors about them?

A. Yes, Mr. Allen was showing them to the Directors.

Q. (*By Mr. S. Wortley.*) The Directors of the Grand Junction Railway Company?

A. Yes.

Q. (*By Mr. Adolphus.*) At the time Mr. Allen showed them, what did he say about them?

A .I was close to him at the time; I did not notice what he was saying, anything further than I heard him mention the saving of oil and reduction of friction.

Q. You say the use of this new plan went on until the time you went away?

A. Yes.

Q. At the time you went, was it used to many of the engines?

A. I could not say to how many, but it became quite general before I left there; most engines were done, more or less.

Cross-examined by Mr. S. Wortley.

Q. I believe you left the service of the Company in consequence of some misunderstanding—did not you?

A. It was no misunderstanding.

Q. Some offence you took?

A. Yes, it was an offence I took, that was the first cause.

Q. I do not want to go into the particulars of it, but you took offence at something, and left them?

A. Yes.

Q. You say you have known this tinning applied to new steps—can you name an engine to which it was applied to new steps?

A. Yes, I think I could name two.

Q. Do, and just be cautious before you do.

A. The Vandal is one.

Q. Did you see the new step manufactured for the Vandal?

A. I did not see the step manufactured, I did not see the step cast; I saw them put on when the engine went into repair, close to the engine, or within four or five yards where I was at work at the time.

Q. The engine went into repair?

A. Yes, the engine was close to me—we were borrowing each other's tools all the time.

Q. Then the engine went into repair?

A. Yes.

Mr. Justice Cresswell.—He said they applied new steps.

Mr. S. Wortley.—That is what I want to know.—(To the witness.) Did you see the step manufactured?

A. I saw the step fitted in.

Q. Is that the only means you have of judging whether it was a new step?

A. It was quite sufficient to judge from, when you see the steps come from the brass foundry unbored to fit in.

Q. Perhaps I do not understand what you mean by fitting in—you do not call it fitting in when the thing is made?

A. Yes, when the thing is first sent from the brass foundry it comes in the rough; then the fitter begins, and files it, and fits it into the box: it goes from thence to the lathe to be fitted in.

Q. That is what you meant by fitting in. Now that is the Vandal—can you name any other to which you have seen new steps added?

A. The Hyperion was under repair.

Q. Are you quite sure of this thing, or are you only expressing an opinion?

A. Quite sure. I am sure, because the man who worked at them worked at the next vice that I was working at at the time.

Q. Then you can tell me who were the men there—who were the men who put the step into the Vandal?

A. Robert Foster and William Haydon were the men who put them into the Vandal.

Q. Who put the steps into the Hyperion?

A. Thomas Jones and John Thomas, they put them into the Hyperion, to the best of my memory.

Q. Now any other engine?

A. Those are the engines that I can bear direct witness to, being close to them.

Q. Was that on one occasion when you saw them put in to each?

A. On several occasions.

Q. But once new?

A. Once new.

Q. How long had those engines been running?

A. Before they came in to be repaired?

Q. Yes.

A. I cannot answer for that. The Vandal, from the time she came out new, I suppose had been running five or six years, I could not say exactly.

Q. They have put tinning to very few of the steps of their engines at all, have they?

A. It was quite general there, especially among the old engines that had been running, and the brasses worn a little; there was a lining of tin put on the top of the step.

Q. They did that often, did they, when they had been worn a little—they put on the tin?

A. Quite common.

Q. All the time you were there?

A. All the time, from the time I commenced to the time when I left.

Q. When did you first observe them put in the tin where it was worn away—was not that always done?

A. No, not always done, not previous to August or September in 1843. I never saw any tinned before.

Q. Just recollect yourself—do you mean to say you never knew them patch the bearings, where they had been worn away, with tin before that time?

A. I never did.

Q. What was your department?

A. Fitting and erecting the engines.

Q. What part of the engines?

A. Every part.

Q. Did you fit the steps yourself?

A. I fitted the steps myself.

MR. THOMAS JONES SWORN.

Examined by Mr. Webster.

Q. Are you a fitter?

A. Yes.

Q. Were you in the employment of the Defendants at Crewe at any time?

A. Yes.

Q. When did you leave them?

A. Last October.

Q. How long had you been in their employment?

A. About four years and a half.

Q. Before you left them in October, had they tinned steps for locomotives?

A. Yes.

.*Q* Had they done both old and new steps, or only one sort?

A. Both old and new.

Q. And applied them to the engines?

A. Yes.

Q. Was the tin of the same thickness throughout?

A. No, it was rather thicker just on the centre of the brass.

Q. And was it thinner at the ends?

A. It was as thin as possible all round except just the centre.

Q. Is that the bearing part?

A. Yes.

Q. I understand you to say it was laid on the brass bearing as thin as possible, except at the bearing point?

A. As thin as possible all around except just at the centre.

Q. I believe you heard the last witness speak of some of those steps being inspected by the Directors—were you present at any time when the Directors inspected them?

A. Yes, and made the remark to him at the time.

Q. Was Mr. Marshall, the foreman, present at any time when the Directors were there?

A. No.

Q. Was Mr. Allen there?

A. Yes, Mr. Allen showed them.

Q. Was anything said at that time, in the presence of the Directors, as to the saving that had been effected by the alteration?

A. I was not near enough to hear that.

Q. (*By Mr. Justice Cresswell.*) When did they begin to use the tin steps?

A. About August, as near as I can recollect.

Q. What year?

A. 1843.

Cross-examined by Mr. S. Wortley.

Q. Did you leave their service at the same time as Benjamin Lewis?

A. No, afterwards; it was October.

Q. You say the tin was laid thickest in the centre?

A. Yes.

Q. So that it would spread as the journal worked on it?

A. No, it would not require it.

Q. Never mind what it required, would not that be the effect?

A. No, it did not spread; some did, no doubt.

Mr. S. Wortley.—Well, some did; I do not care whether it is much or little.

MR. JAMES EDWARD M‘CONNELL SWORN.

Examined by Mr. Baines.

Q. I believe you are the engineer of the Birmingham and Gloucester Railway, are you not?

A. I am.

Q. Have that Company adopted the invention of Mr. Babbitt, the patentee here?

A. They have.

Q. Have you found it to answer well?

A. Yes, we found it to answer very well.

Q. Are you now adopting it in all your engines?

A. From the first introduction of it until now, we have been continually adopting it.

Q. You have been continually enlarging it from the first?

A. Yes.

Q. How many engines have you it in use upon now?

A. I believe all our engines have the patent metal upon them in some of the parts; in some of them, I believe all the working parts are fitted out with it.

Q. Are there about thirty engines altogether?

A. About thirty.

Q. Have you had some of them made without the ledges which are spoken of here?

A. With brasses that we have been repairing. I never take the trouble of cutting recesses in the brass to make the ledges, but simply bore a few holes in different parts of the surface; after the brass has been washed with tin, we run the alloy into the brass, and the recesses between the brass and the mandril; of course it runs into those holes. I consider that is perfectly sufficient; we never found it give way.

Mr. Justice Cresswell.—That is what is suggested in the specification?

Mr. Baines.—Yes, my lord.

Q. (*By Mr. Baines.*) Now, what are the advantages you have found to result from the use of it? state them shortly.

A. In the first place, there is a very great decrease in the wear of the brass itself; rather, we found they do not require so much attention in repairs. In the next place, there is a diminished consumption of oil; we do not use so much oil in the working parts of the engine; and, in the next place, it reduces the friction. I think the engine does not absorb so much of her power in her own moving parts; we can pull more of a load, in consequence of the decreased friction.

Q. May I ask whether you ever saw or heard of any plan of lining the bearings in this way before this?

A. I never saw or heard of a plan similar to that before.

Cross-examined by Mr. S. Wortley.

Q. I believe you have heard of a plan for lining the bearing with soft metal, before this?

A. I recollect hearing at Gurwood's manufactory, in Glasgow, there were some brasses that were found to heat. I believe it was of a circular saw, which revolved with considerable velocity, and I believe there was a tinning put on.

Q. (*By Mr. Baines.*) Did you see that yourself?

A. I saw the brasses, but I did not perform the operation.

Q. (*By Mr. S. Wortley.*) You saw them after they had been tinned?

A. I did not see them put on; I saw the tinning on the brasses.

Q. Was it fused on the brass?

A. It was washed on, in the usual way.

Q. For the purpose of preventing heat?

A. I believe that was the intention of it.

Q. What sort of a manufactory was that?

A. A steam-engine manufactory.

Q. Have you known any other instances where it has been used?

A. No, that is the only instance that I recollect.

Q. (*By Mr. Justice Cresswell.*) When was that?

A. It would be about ten or eleven years ago.

Q. (*By Mr. S. Wortley.*) How long have you been engineer to the Birmingham and Gloucester Railway Company?

A. Four years.

Q. Where were you before that?

A. I was in Mr. Vernon's, at Liverpool; before that, at Mr. Berry's, at Liverpool.

Q. Did you begin there?

A. I did not; I served my apprenticeship in Scotland.

Re-examined by Mr. Baines.

Q. It was in Scotland where you saw this?

A. It was in Glasgow.

NICHOLAS ADAMSON SWORN.

Examined by Mr. Martin.

Q. Are you an engine-driver upon the Birmingham and Gloucester Railway?

A. Yes.

Q. Have you been so for the last two years?

A. Yes.

Q. Before the adoption of this tin-lining, used it frequently to occur to you that your bearings got warm?

A. Yes.

Q. Since you have used this plan, have you found that take place?

A. No, never.

Q. I suppose you go at a great pace sometimes?

A. Yes.

Q. Do you also find a great reduction in the consumption of oil?

A. Yes.

Q. What would be the reduction, should you say?

A. Before the introduction of this tinning, we used to take three pints, from that to two quarts, the 106 miles; now we can do with a quart.

Q. Before this time, did your engines frequently require repair?

A. Yes.

Q. I believe, every fortnight they required something done to them?

A. Yes.

Mr. Justice Cresswell.—The engineers are likely to know that better.

Mr. Martin.—This man is a practical man, and knows all about it.

MR. THOMAS ALLEN SWORN.

Examined by Mr. Adolphus.

Q. Are you foreman of the locomotive department of the Birmingham and Gloucester Railway Company?

A. I was.

Q. Have they used the invention you have heard spoken of to-day?

A. Yes.

Q. How have they found it answer?

A. Very useful.

Q. Are they adopting it much?

A. Yes, upon all their engines.

Mr. Justice Cresswell.—This is the same line.

Q. (*By Mr. Adolphus.*) In what respect do they find it useful?

A. In the saving of oil and diminution of labour.

Q. To what amount do you find the saving of oil?

A. About one-third.

Q. (*By Mr. Martin.*) And is the diminution of labour great?

A. Yes.

Q. (*By Mr. Adolphus.*) To what extent?

A. Why, from four days to five months in the overhauling.

Q. Before the plan was introduced by Mr. Babbitt's invention, have you ever heard of that plan before?

A. Never.

MR. BENJAMIN CUBITT SWORN.

Examined by Mr. Webster.

Q. I believe you are engineer to the South Eastern and Brighton Railways?

A. I am.

Q. You were formerly in the house of Fenton and Murray's, of Leeds?

A. Yes.

Q. And had great experience in machinery?

A. I was there about nine years.

Q. You say you are engineer to the South Eastern Railway. Has that Company adopted the bearings of Mr. Babbitt?

A. Yes, they have.

Q. Have they adopted them to other lines?

A. No other line that I am connected with.

Q. How do you find them answer?

A. Very well indeed.

Q. What is the nature of the saving that is effected by them?

A. A great saving in friction and wear and tear; great saving of oil.

Q. What is the extent of saving?

A. I tested it with one engine in this way: one connecting rod with this kind of brass, and one with a common brass; the engine run with the soft metal 29,000 miles—upwards of 29,000 miles.

Q. The one with the tin or soft metal ran upwards of 29,000 miles?

A. Upwards of 29,000 miles. The other connecting rod, with the common brass, was worn out in that time; it got so worn as not to be trusted any longer.

Q. Does that enable you to effect the diminution in the number of engines that are requisite for working a line?

A. I should say it would.

Q. To what extent?

A. I can scarcely say to what extent.

Q. Less engines would be sufficient for the purpose if they were all fitted with these bearings?

Mr. Justice Cresswell.—That is very likely to be the result.

Mr. Webster.—If they do not wear so fast, they do not want repairing so often, and they will not have so many under repair; therefore, they will not require so many.

Mr. S. Wortley.—I have asked no questions about the utility of this. I do not know what is the object in going on with this.

Mr. Justice Cresswell.—I do not know, indeed.

Mr. S. Wortley.—It is a keeping up this matter, which is a mere matter of prejudice.

Mr. Baines.—Prejudice?

Mr. S. Wortley.—I have never cross-examined to a word of it.

Q. (*By Mr. Webster.*) Is the lining of the bearing with tin new?

A. It is.

Q. Your attention has been called to the different modes of tinning, the one with the ledges and the other in which the tin runs to nothing?

A. Yes.

Q. Do these answer the same purpose?

A. Equally the same. I think it would not last quite so long.

Q. Does the thin coat of tin next the metal prevent the other metal from spreading—the other metal alloyed to it?

A. Yes.

Crossexamined by Mr. S. Wortley.

Q. You say you consider the lining of the bearing in this way for this purpose is new?

A. Yes, I do.

Q. You have known bearings of soft metal introduced by fusion, have not you?

A. No, I have not.

Q. Not for the purpose of supporting the journal?

A. No.

Q. What description of machinery is it you have been conversant with: I think you spoke of Leeds?

A. Mill-works and engine-works generally.

Q. Mills and engines?

A. Yes.

Re-examined by Mr. Baines.

Q. I believe the house at Leeds that you spoke of is one of the greatest machine manufactories in the country?

A. It is.

Mr. Justice Cresswell.—Whose is it?

Mr. Baines.—Fenton, Murray and Wood, is it not?

The Witness.—Yes.

MR. MELLING CALLED.

Did not answer.

MR. ARCHIBALD STURROCK SWORN.

Examined by Mr. Baines.

Q. I believe you are manager of the works of the Great Western Railway, at Swindon, are you not?

A. Yes.

Q. Has the soft metal lining, according to Mr. Babbitt's patent, been introduced generally into that Company's engines?

A. Yes.

Q. I believe they now use nothing else?

A. Wherever a brass wears out we renew it with one of Mr. Babbitt's bearings.

Q. Have you found it useful?

A. I think so.

Q. Possessing durability and coolness?

A. Yes.

Q. How far will brass lined with it run in comparison with the ordinary brass, according to your observation?

A. I cannot tell.

Q. Much further?

A. They have run so much further I have not been able to form an opinion when they gave way.

Q. Then there is very great improvement, is there, in the durability?

A. I think so.

Mr. Justice Cresswell.—I think when you get that answer you might be satisfied with that.

Cross-examined by Mr. S. Wortley.

Q. I believe Mr. Gooch is the principal engineer in the locomotive department on your line?

A. The principal engineer.

Q. He has been here?

A. At Liverpool?

Q. Yes.

A. He has been here, I have no doubt.

Q. I mean upon this occasion?

A. No.

MR. WILLIAM FERNIHOUGH SWORN.

Examined by Mr. Martin.

Q. Are you superintendent of the locomotive department of the Eastern Counties Railway?

A. Yes.

Q. Have you introduced this improvement of Mr. Babbitt's.

A. To a certain extent.

Q. Are you having your new engines built with it?

A. Some of them.

Q. In your judgment, is it, so far as you are aware of, new?

A. Yes, it is new, decidedly.

Q. I suppose your attention has been directed to these matters for a considerable time?

A. A great number of years.

Q. And you can state that it is new, decidedly?

A. Yes, in that application.

Q. You concur, I suppose, with the witnesses, in the benefits derived from it, as to the wear and tear and saving of oil?

A. As to the wear, particularly.

Q. It affords much more wear than the simple brass; works a great deal longer than the old brass?

A. Decidedly so.

Cross-examined by Mr. S. Wortley.

Q. You said something about this application of it: what was it?

A. I mean the application with the retaining ridges.

Q. That is what?

A. I think that is what I call a very decided improvement, but the application without would, I think, be quite ineffectual in practice, if made thick enough to be of practical service; I mean to say, as to the time—as to the duration.

Q. I need hardly ask you whether you do not consider the rims as a very material part of the patent?

A. I consider them as perfectly essential to what is called the soft metal bearings; if you apply the soft metal without these, you cannot make it thick enough to last.

Re-examined by Mr. Martin.

Q. As I understand you, if you put it on without these fillets, or this thing to hold it, you cannot put it on thick enough to make it so useful as it would be with these fillets?

Mr. S. Wortley.—He does not say so.

Q. (*By Mr. Martin.*) Is that what you say?

A. That is what I think.

Q. Is that your opinion upon the subject?

A. Yes.

Q. And that the evasion of it, by putting it on very thin, is of no great use?

A. No.

Mr. S. Wortley.—Is that a proper question?

Mr. Justice Cresswell.—It is very irregular; Mr. Martin has exhausted all his regularity.

MR. MELLING SWORN.

Examined by Mr. Adolphus.

Q. Are you an engine-builder?

A. Yes.

Q. Where?

A. At Rainhill village.

Q. Is that near Liverpool?

A. Yes, ten miles from it.

Q. Were you formerly manager of the locomotive department of the Grand Junction Railway?

A. I was.

Q. For how long?

A. From the opening until January 1840.

Q. When did you leave?

A. In January 1840.

Q. How long had you been manager?

A. About five years, as near as I can recollect; I cannot speak to it with certainty.

Q. While you were there, was the tin lining for bearings ever used by the Grand Junction Railway Company?

A. Not to my knowledge.

Q. Are you aware of its having been introduced by Mr. Babbitt?

A. I am.

Q. Before it was so introduced, had you ever met with it in your recollection?

A. No.

Q. Do you produce a specimen of a piece of tin lining?

A. No Sir.

Mr. Allison re-called.

Q. (*By Mr. Martin.*) Do you know of the use or the attempted use of some bearings of tin?

A. I do.

Q. Did you see in Ireland, bearings of tin used upon a locomotive engine?

A. Solid block-tin steps for a locomotive engine.

Q. Where was that?

A. On the Dublin and Kingstown Railway.

Q. Can you tell me, was it an engine of Sharpe, Roberts and Company?

A. It was.

Q. Can you tell me, were the steps found to answer?

A. They did not answer well.

Q. (*By Mr. Justice Cresswell.*) How do you know?

A. From seeing the engines working.

Q. (*By Mr. Martin.*) Were you in employment there, or not?

A. I was out from Mr. John Forrester with engines from the Vauxhall Company.

Q. They are manufacturers of locomotive engines here?

A. They are.

Q. And you saw those at work, and they did not answer?

A. They did not answer very well.

Q. Did they require repairs, were they taken out frequently?

A. They were taken out very frequently.

Q. (*By Mr. S. Wortley.*) Did you see them taken out very frequently?

A. I have seen them taken out and eased sideways.

Q. Have you seen them taken out frequently?

A. I have seen them taken out often during the time I was there.

Q. (*By Mr. Martin.*) From your experience of these matters, did they answer the purpose well or not?

A. They did not,

Cross-examined by Mr. Wortley.

Q. How long were you there?

A. Between five and six months.

Q. What were you doing all that time?

A. I was sent out by John Forrester and Company, during the time they held the engines for six months.

Q. What, to keep the engines in repair?

A. Keeping the engines in repair for six months.

Q. Did they go on using the tin bearings all the time you were there?

A. They did.

Q. And they were using them when you came away?

A. They were on when I came away, they were taken out very soon afterwards.

Q. You cannot tell that if you were not there?

A. Just merely from the parties that told me they were taking them out.

Q. Never mind what you were told, I dare say when you say they were taken out very frequently, that is what you were told?

A. I saw that.

Q. How many engines were there that had them?

A. Three.

Mr. Baines.—The correspondence I have already read: that will be the plaintiff's case, my lord.

Mr. S. Wortley.—Does your lordship wish us to go into our case to night?

Mr. Justice Cresswell.—No, but I should like very much to go into the case at eight o'clock to-morrow.

[Adjourned until eight o'clock to-morrow morning.]

SECOND DAY.

Mr. Baines.—I believe it is understood that a copy of the correspondence is in, although it was not read?

Mr. Justice Cresswell.—Yes.

Mr. S. Wortley.—I submit to your lordship that my learned friend has not proved any infringement of this patent, as it is claimed by this specification; and for this purpose I will call your attention to the terms of the specification, and in doing so I shall contend that the real patent in this case is the mode of retaining the lining which is specified in this instrument, and that that is the real invention, and that it is so treated by the inventor himself, and is claimed by the specification. In the first part of the specification he says,—"This invention, which has been communicated to me from a certain foreigner residing abroad, consists, first, of certain improvements in the manner of making or constructing the boxes within which the gudgeons or journals of machinery of various kinds, and particularly the axles of railroad cars, of locomotive engines, and of other cars and carriages, are to run; and those improvements are applicable, not only to boxes for axles or gudgeons, which are divided so as to form semi-cylinders, but also to boxes, bearings, or sockets that are not divided, and which form a continuous circle; and also to sockets which are square, or of any other desired form, and within which a rod or bar is to slide; as, for example, the guide-rods used in locomotive and other steam engines." The second is for an improved method of constructing the oil-boxes, with which we have nothing to do. Then it goes on:—"The boxes in which the gudgeons or axles are to run are to be formed and prepared in the ordinary way of those which are to be received into the housings or plummer-blocks of locomotive engines, cars, and other machinery, they being made of brass, bell-metal, or any other metal or metallic compound which has sufficient strength, and is capable of receiving a coating of tin. The inner parts of these boxes are to be lined with any of the harder kinds of metallic compounds or alloys known under the names of Britannia metal or pewter, and of which compounds or alloys block-tin is the basis. An excellent compound or alloy for this purpose may be prepared by taking about fifty parts of tin, five of antimony, and one of copper; but other compounds or alloys, analogous in character, may be used. To prepare the boxes for this composition, they are to be cast with projecting rims or fillets along their interior edges, and on their ends within their semi-cylindrical parts, or on the ends only of the boxes or sockets when they are not divided. The interior of these boxes, and the ledges, fillets, or rims above named, are then to be cleaned and tinned, in the usual way of performing that operation." Then it goes on to describe:—"A cylindrical or semi-cylindrical core of the exact size" is to be introduced. Then it describes the way in which it is to be moulded; and then, rather further down, after describing the way in which the metal is to be introduced into the aperture,—" This aperture in the boxes for railroad cars and locomotive engines may consist of a hole an inch, more or less, in diameter." Then it goes on:— " The metallic composition, when melted and poured into the box, which has been prepared by being tinned, will unite firmly with its interior, and will cover the edges of the rims or fillets, so as to prevent contact between them and the gudgeons, axles, slides, or stems, which they are to receive, whilst the ledges will, at the same time, effectually prevent any tendency in the composition, metal or alloy to spread, from the weight or friction of the load, or the motion of a slide or stem. In boxes thus prepared, the heating and abrasion which are so apt to occur in boxes as ordinarily constructed, does not take place, and their durability is consequently increased." It is manifest, therefore, from that part of it, that the essential part of the invention is the box with the rim. In that part of the invention there is no suggestion that even any other mode can be adopted; the boxes are to be prepared in that manner, for the purpose of receiving the alloy. Then, when he comes to the part in which he makes his claim, he says:—" I claim, as the first part of the invention which is secured to me by the hereinbefore in part recited letters patent, making or constructing the boxes within which the journals or axles of machinery are to run, or within which the rods of slides, or the stems of valves and other analogous parts of machinery, are to slide, by providing them with rims or fillets."

Mr. Justice Cresswell.—He claims that as new.

Mr. S. Wortley.—Yes, and I shall contend he claims that as the invention.

Mr. Justice Cresswell.—As part of it.

Mr. S. Wortley.—" Along their edges and at their ends, or at their ends only, according to the nature and form of the box, in the manner and for the purpose herein set forth, and lining such boxes, prepared in such or a similar manner, with a metallic composition or alloy, of which tin the basis, for the purpose"——

Mr. Justice Cresswell.—No, there is a stop at "basis." "For the purpose herein fully made known."

Mr. S. Wortley.—In my copy the stop is afterwards. "For the purpose herein fully made known and described." Then he goes on to say:—"Instead of employing rims or fillets for the purpose of holding or retaining the metallic compound or alloy, other methods, such as making knobs, projections, or holes, may be adopted. I do not, therefore, intend to confine myself to the precise manner in which the invention is carried into effect; it is evident that the mode may be varied, without departing from the nature of the invention." On the one hand, he does not specify any particular alloy, nor any particular mode of lining, but he does specify, as the substance of his invention, a particular mode of making the rims or fillets; and the particular manner in which they are to be made is specifically described, and they are put in the very front of the specification, as the principal of the invention. They are described also in the plan which is attached to it, and they are made, not only a substantial part, but, as I shall submit to your lordship, they are made the very—— I do not know whether your lordship has a copy.

Mr. Justice Cresswell.—Yes, I have a plan.

Mr. S. Wortley.—They are made the very principal subject-matter of the patent, and are treated in the specification as being essential to it. The alloy may be of any sort; there is no specification as to the thickness of the alloy, it is merely that it is to be laid upon the hard metal after tinning. There is no novelty in that, as we have it already upon the evidence; merely laying an alloy upon a hard metal, with the intervention of tinning, there is no novelty in. But what he appears to me, and I shall submit to your lordship, to claim by this specification, is the peculiar mode specifically described, in the first instance, by the rims or fillets, of confining the metal so used as a lining, merely allowing that latitude which is permitted to him, of saying there are other processes, such as knobs or holes, which, having the same retaining effect as the rims or fillets I have specified, may be resorted to for the purpose of using this patent. I should submit, that being the case, my learned friends have not shown we have in any degree infringed upon the invention for retaining the lining, which I submit to your lordship is the principal object of this patent and specification.

Mr. Crompton.—I will add one word to what my learned friend has said; I will draw your attention for a moment to what does appear to be the invention, and really if that is not it, I should like to know what is the invention and the claim they make. I submit, really, the claim this patentee makes, is a peculiar mode of applying the alloy, by the means specified in his specification, particularly in his claim, that there are some things equivalent he points out, as the material, and necessary, and only part of his invention. The question of construction is for your lordship.

Your lordship on looking at this specification would say that that was really the invention. Now the invention is neatly stated in the claim; I think the earlier part has been referred to sufficiently by my learned friend, it is neatly recited again in the claim. The only part of the patent with which we have anything to do, is the making or constructing those boxes within which the rods are to move. Then he states how. Now that is the invention,—"By providing them with rims or fillets along the edges and at their ends, or at their ends only, according to the nature and form of the box, in the manner, and for the purpose, herein set forth, and lining such boxes prepared in such or a similar manner" —he always looks back, as to that, to the former part— "prepared in such or a similar manner with a metallic composition or alloy, of which tin is the basis." Now, in that part, he shows his invention to be what one of his witnesses described it as. Your lordship sees where this metal is put upon the surface, as one of them described, it has a tendency, when there is great pressure, to spread out; these fillets are made, as he says, here, by which, according to his invention, he attains that object: but he says you may have something equivalent, you may have the fillets. I do not confine myself to fillets—you may have something which will also confine it, as you may have a hole or knob, which it is plain will be the same as fillets. Then, suppose the party merely puts the alloy upon the metal and joins it in the old manner, and there is no knob, or hole, or fillet, is that any infringement? I submit to your lordship there is no evidence of our using anything in the nature at all of fillets or knobs, or anything equivalent,—what I submit is, he plainly says I must have something to prevent the spreading of this metal, that is my invention. My invention is, making these boxes in this particular manner, by providing them with these fillets, which will have the effect of preventing the spreading of the metal, but I will not confine myself to that, there may be an equivalent. That is as much as saying, I must have an equivalent, or else it is not in my invention. Now we have put it on without any equivalent.

Mr. Justice Cresswell.—Mr. Cowling, do you wish to add anything?

Mr. Cowling.—No, my lord.

Mr. Justice Cresswell.—You need not trouble yourself, Mr. Baines: it seems to me the patentee claims two things; he claims a box or bearing lined with tin, tin put in the usual way, a tinning and an alloy of tin so as to have a hard substantial outer casing, lined with a softer metal, which is to have the effect of diminishing friction and the tendency to heat; and he also describes the best mode in which that can be applied, namely, fillets, or holes, or knobs, or some mechanical contrivance of that sort. But I take the invention he claims to be for boxes lined with tin, and a soft metal in addition kept in the box by some mechanical contrivance. That I take to be the nature of the claim; and if you have used any portion of that, I think that you cannot say that you have not infringed his patent. Whether the portion that you have infringed is a sufficient subject-matter to sustain a patent is another question. But I think that there is evidence of your having used part of that which the patentee has claimed as his invention, and for which the patent has been granted to him. Whether the application of the tinning and the alloy of block-tin afterwards in addition to that, is a sufficient subject-matter to sustain a patent, is another question; but I think that there is evidence to go to the jury, which I am bound to leave to the jury, that the Defendants have used part of that for which the patent was granted, whether well-granted, or not, at present it is not necessary for me to decide.

Mr. S. Wortley.—May it please your lordship. Gentlemen of the Jury, in addressing you on behalf of the Grand Junction Railway Company, I trust that the gentlemen who are in the management of that great concern are sufficiently well known to some of you, or at all events stand sufficiently high to render it unnecessary for me to enter into any vindication, from the charge of having intentionally or surreptitiously appropriated the invention of another man. On the contrary, from all the evidence in the case, as well as from the correspondence which was read by my learned friend, it is manifest that all that has been done by them has been done perfectly openly, without concealment or dissimulation, and under the firm impression which they entertained down to this time, that in what they have done they have in no degree infringed the patent which has been taken out by the plaintiff, and that they have merely availed themselves of a mode of procedure which has been well known, and the principle of which is in no degree new.

Now gentlemen, I think you will have observed that my learned friend in the course of his case yesterday, detained you, and detained his lordship, by a great mass of evidence which was rendered to a great extent useless. It is perfectly true that upon the record there is a denial of the usefulness of this invention. It is equally true, that upon that record there is a plea denying that there was any sufficient specification made out. It is equally true, as stated by my learned friend, that upon the record there is a plea denying the specification was enrolled. But these, gentlemen, are matters of form. I believe that in almost every patent case, certainly in every one that has come under my notice, that is a common form of pleading, including a sufficient number of pleas to put the plaintiff upon the proof of all that he alleges when he comes to complain of the infringement of his patent. But really and substantially it was evident from a very early period of the day, yesterday, from the course which I took, and the course which the case was taking—clearly and substantially it was evident that there was no dispute raised about the usefulness of this patent in its perfect shape; yet my learned friend—for what purpose, unless it may have been perhaps a very venial purpose, very advantageous purpose for him, namely, for the purpose of puffing his invention,—for what purpose he could have, gentlemen, in calling engineers one after the other from one end of the country to the other, of whom I asked not one single question in cross-examination, as to its usefulness, I really cannot for my life find out. I think my learned friend introduced his evidence as he introduced his observations upon the correspondence to which I shall have afterwards to allude—rather for the purpose of creating a prejudice in your mind, by, in the first place, exalting the benefits of this invention, and, in the next place, by diverting your attention from what is really and truly the matter in dispute between the parties in this case. As I have said, I asked no questions of those gentlemen as to its utility. In the very correspondence which my learned friends relied upon, it is stated we acknowledged that in the form in which he manufactures his patent boxes, that there is utility, that it is a useful invention, and my learned friend and his clients had therefore no reason to expect there would be any real contest on that part of the subject; the denial of its utility on the face of the record being mere matter of form, and it being perfectly evident that was not the real contest between the parties. Therefore it now becomes extremely important to recall your attention to what is the real question in this case. There is no very distinct allegation on the face of this specification of what the invention is. His lordship's impression is, that the invention consists, under this specification, of a combination,—

of a combination consisting of a soft metal laid upon the ordinary tinning as intervening between it and the hard metal, combined with a mechanical contrivance for the retention of that metal in that condition. That seems to be his lordship's impression of what the invention is which is specified in his patent. Looking at the patent, it is extremely difficult to ascertain, and probably it is done for that very purpose of making it less plain, whether what is intended to be claimed as the invention, is the mere application of that lining, or, on the other hand, whether it is the fillets and the retention of the lining which is the principal subject of the invention. But be that as it may, I apprehend before the patentee can claim any damages at your hands, he must not only show we have used something analogous to what he uses, but that that portion of it which he says is analogous to what he uses, was not known, and that it is not new as regards the manufacture.

Now just observe. This invention is not claimed merely—and there is another thing which has been kept out of your sight—I think any person who heard the trial of yesterday, would have been under the impression that this was claimed as a mere improvement of locomotive engines—it is claimed as applicable to all sorts of machinery, to every species of machinery used in any species of manufacture in this kingdom, wherever there are bearings or where there are slides with rods running through; and if this patent, upon this part of it, upon the mere question of a lining, as is now relied upon by my learned friend, be established to that extent, why then every manufacturer throughout this district must be extremely cautious how he introduces any tin or any alloy of tin into any one of the bearings of his machinery, because with whatever object he does it, it will still have the effect of easing the working, it will have the effect of preventing heat; and if we have invaded the patent, every manufacturer under these circumstances must be held to have invaded the patent also. It becomes extremely important. Here is a patent claim, consisting of a very clever combination, which I do not for one moment deny, consisting of at least three parts; consisting of the outer box; consisting of the lining in this thick state—and the thickness of it, as you heard yesterday, is extremely important, for, as Mr. Fernihough said, unless it be thick it will not answer its purpose—consisting again of alloy instead of tin laid upon the ordinary tinning, intervening between it and the hard metal, and being confined by a fillet round the edges, and fillets across here, which have the effect of retaining that thick and soft alloy in the place where the greatest stress of the machinery lies, and so easing that portion of the machinery, and yet now, according to the exposition which his lordship has given of the patent, what we are sought to be fixed with as an infringement, is the mere application of tin to the bearings. Because, again, I say it signifies not whether it is in locomotive engines or not—the patent is claimed for every machinery; the patent, if it applies here, applies to every bearing in every cotton spinning manufactory, in every manufactory for making machinery, in every other manufactory throughout this country, and the neighbouring manufacturing counties in England—and if any person, if this be established as part of the patent, shall use block-tin or any alloy of which block-tin is the basis, in any portion of the interior of the bearings, they will be liable to an action for infringement by this party, as having introduced the soft metal for the purpose of easing the working of the bearing.

Allow me therefore to point out to you the importance of this and the extent to which it will go. It now becomes my duty to call your particular attention to what the specification and the claim is. That I have not misrepresented it, will appear by the terms of the specification itself. In the first part he says, "My invention consists first of certain improvements in the manner of making or constructing boxes within which the gudgeons or journals of machinery of various kinds, and particularly the axles of railroad cars, of locomotive engines and other cars and carriages are to run, and those improvements are applicable not only to boxes for axles or gudgeons, which are divided so as to form semi-cylinders, but also to boxes, bearings or sockets that are not divided, and which form a continuous circle, and also to sockets which are square, or of any other desired form, and within which a ro or bar is to slide." Therefore he describes his invention to be not at all confined, as I have said, to locomotive engines, but to apply to all machinery, merely specifying locomotive engines, cars, and other carriages, particularly as being those to which it may be advantageously applied. Then in a subsequent part of this specification he states that it is for machinery in general. And therefore, gentlemen, I think I am justified in saying this becomes an exceedingly important question as regards the whole manufactories of this district, where bearings and gudgeons and journals, as they are called by these engineers, are in constant use in almost every part of every description of machinery.

Now, gentlemen, this being the invention consisting of that combination, what has my learned friend proved as the infringement by the Company? It is not pretended that we have used anything like that—that is not pretended—there is a minute description in the specification of the process of making this instrument; we have not gone through any one portion of that described process. In the specification is first described this case into which the lining is to be introduced—it is to consist of hard metal—it is particularly described—it is to be furnished with these rims or fillets, as they are called, round these edges; and round these edges (pointing to the model): it is then described that a mandril or roller is to be introduced, of a proper size with a flat surface; that the two ends are to be closed up, as it here appears; that then an aperture is to be made through which the tin alloy can be introduced, so that this acts as a perfect mould, and forms the lining in the perfect shape in which it is here represented, particularly describing how it is of advantage that they, by that means, and making it from the mould, the tin shall cover these ridges, and assume the exact form which it does assume in the perfect instrument. Now it is not pretended that any one step in that process has been followed by the Defendants. They have made no box in this shape with the fillets or rims, or any other equivalent, or similar contrivance for the purpose of the retention of the tin; on the contrary, so the proof is, that the only application they have made of the tin is, in the first place, not with any alloy at all—and the specification talks of nothing but alloys, never once mentions tin, it seems to exclude tin—but, so far from its being applied in any such manner as to prevent its spreading, and to retain it in its exact position, it is in proof it is introduced the thickest in the part where the pressure is greatest, that no doubt being so, the effect would be to give ample room for its extension and spreading on a more even surface. Again, we have not used any mandril introduced into the machine—we have not run the metal in—it has not been used by way of a mould at all—in point of fact, no one step in the process, described by this specification, has been resorted to, or was in the least necessary, for the purpose of the patent. Yet we are to be told, that although the thing so described is utterly dissimilar—for it is said it is totally unlike this, instead of being a good thick substantial metal arranged in this manner—the way the Company did it, is, putting a little thickish tin in the middle, fining it off as much as possible to the edges, not by running in a mould, but by working it with a soldering iron; the two things being as dissimilar as things possibly can be, and no one step of the specified patented process being pursued by the Defendants.

Now my learned friend seems inclined to throw over a great portion of this invention. Upon his lordship's construction of the specification I doubt whether he will be at liberty to do so; but my learned friend seemed inclined to throw over the greater part of this invention, and, if possible, assisted by my learned friend Mr. Martin, altogether to get rid of the rims or fillets, and the mechanical contrivance for the purpose of retaining the lining, as wholly unimportant, and as being of no consequence in the case at all, and of no consequence to the patent. Why how is the case? Is not the proof, on the contrary, that that is a most essential portion of the patent—that, in point of fact, the patent would be useless without it—that it would not work, and that the mode in which it is described to be formed by the patentee, without these retaining rims, or something equivalent to it, some mechanical means of retention, would produce a thing which, for the purpose for which it is pretended to be invented, would be utterly valueless and useless? You will remember, gentlemen, I am sure, the evidence on that part of the subject which was given yesterday. Several witnesses, when asked by me whether the retaining rim, or some mechanical equivalent of that sort, was not the most useful part of the invention, immediately said it was. When we came to Mr. Fernihough, the intelligent gentleman who is the manager of locomotive engines on the Eastern Counties' Railway, when he was asked about it, without any pressing at all, he said in distinct terms, Not only do I consider it useful, but I consider the rims and retaining of the lining the essential part of the invention: without it, the invention is utterly useless, for, he said, it is impossible, without rims or some mechanical contrivance for the purpose of retaining the lining, to have the lining thick enough to answer the purpose which is desirable. Therefore, though my learned friend, Mr. Baines, in his opening, was willing to have thrown over altogether, and felt the weakness of, his case in that respect, and was anxious to throw over the fillets and rims as being essential, confining his invention, as nearly as he could, to the alloy used as a lining—that was his expression—used as a lining upon a hard substance with tin intervening—I will not misrepresent my learned friend, I took it down—the invention is a coating of alloy, metal used as a lining upon a tin coating for the purpose of avoiding heat. Again, such an alloy as a lining, and for the purpose, is quite new. My learned friend, therefore, in no degree relied on that which turns out to be the essential, as I think you will see is really and truly the essential, part of the invention, but endeavoured to contend the invention was, and that which he complained of the infringement was, the mere lining upon tinning, for the purpose of preventing heat and abrasion. And you will remember, gentlemen, I am sure—my learned friend Mr. Martin is not here—but you will remember when Mr. Fernihough came out with a most important piece of evidence, which showed my learned friends were wrong in that respect, and the real essential part of the invention was a mechanical contrivance, whether by rims, fillets, or knobs, for the purpose of retaining the tin, so giving you the opportunity of having the tin thick; my learned friend Mr. Martin, who is, I am sorry to say, at all times rather irregular, broke out into a paroxysm of irregularity, and endeavoured to persuade the witness to say something he did not say, and he tried to put something else into his mouth which would suit his case better. The fact was, it came out spontaneously from Mr. Fernihough—it is the real truth of this case—it is manifest from the investigation, as far as it has gone hitherto, from the whole of it, that this invention is valueless and absurd—I do not hesitate to use the words—unless accompanied with retaining fillets or something equivalent to them; whereas if you take it with the retaining fillet, with the rims, any mechanical contrivance for retaining the lining in this particular position, I am at once willing to admit, as the Company have admitted from the first, it is a valuable invention; and after the evidence given yesterday it would not become me to deny that it is an invention of great value for these Companies, and for the use of locomotive engines in particular. But my learned friend seemed inclined to draw this sort of distinction. There is nothing new in the case of hard metal—there is nothing new in mere tinning, tinning hard metal—neither of these things are new; there is nothing new in joining, by means of fusion, a soft alloy metal upon a hard one with intervening tinning. That we had from Mr. Fothergill, in the first instance, who said, the soft metal will in no case adhere to hard metal, unless tinning intervene; and from Mr. Fairbairn, who said in so many words that which I believe must be known to every one of you, that the process of joining a soft metal to a hard one by means of an intervening coat of ordinary tinning, so far from being new, is a common, vulgar, and ordinary process. Therefore there s nothing new in that.

My learned friend, again, having thrown over his rims and fillets, as not being a necessary part of his invention, for so he treated them, seemed to be anxious to rely upon this, more particularly when I had got from Mr. Fothergill that portion of the evidence in which he stated that even in Messrs. Roberts's works,—and, by-the-bye, though I asked Mr. Fothergill whether he was here, and Mr. Roberts was proved to be here, my learned friends did not call him, whether it was because Mr. Roberts had sent engines to

Ireland, of which the bearings were tin, or whether because, as Mr. Fothergill stated, it had been very common in Messrs. Roberts's manufactory for tin to be introduced into the bearings, for the purpose of making them fit better, or for what other reason I do not know—my learned friend did not call Mr. Roberts; but after I got from Mr. Fothergill, in Mr. Roberts's it was not unfrequent, and he had known it frequently done, to introduce into the bearings a quantity of tin, for the purpose of making them true again, when they had been worn by the gudgeons and journals; for the purpose of making them true again, they introduced tin under the gudgeons, for the purpose of making them fit. My learned friend seemed to be inclined to draw this very fine distinction,—" true, soft metal has been run into bearings;" or, rather, Mr. Fairbairn would try to represent they had been fitted on by some other means:—" True, tin and soft metal has been introduced into the bearings that lie under the journals or gudgeons; the journal or gudgeon, true it is, runs upon that tin and soft metal, and has done; that is a process that is known, but the purpose is not the same." And my learned friend seemed to try to draw that distinction. The purpose for which the tin or soft metal, in these cases, was introduced, was one of fitting the journal to the bearing; the purpose for which the patent introduces it is different, for the purpose of easing the working of the machine.

Now, first, I do not know that those purposes are so very distinct, because, as I asked Mr. Fothergill, as the fact undoubtedly is, a part of the cause of heat and friction is the parts not fitting perfectly, and, in proportion to the heat and friction, will they cease to fit perfectly; therefore, at the same time that the tin is introduced, as the immediate and occasional effect of making the gudgeon and journal fit more closely to the bearing, it, at the same time, necessarily has the effect of diminishing the heat, the friction, and the inconveniences arising in these cases.

But is there anything substantial in this distinction attempted by my learned friend? You will probably hear from his lordship what his judgment is upon that part of the subject. I apprehend that the mere application to a new purpose cannot make a patent, or cannot support a patent. For instance, we all of us know the familiar case of Mackintosh's invention—a most ingenious and a most valuable invention—and the purpose to which it was applied. The purpose for which it was professed to be invented was for keeping out the rain. But supposing some gentleman was to find it was equally valuable under other circumstances, for the purpose of keeping out the sun, would he be entitled to take out a patent for its application to keep out the sun? Yet what is the difference? That is a thing which when it was used for keeping out the rain did keep out the sun. It was not the purpose of the invention, it was not a purpose at that time contemplated; but under different circumstances, in a different climate, it becomes much more important to keep out the sun than the rain. Is a man to say, I have a right to take out a new patent for that, because I have applied this invention to a new purpose?

Again, take another very ordinary illustration. We are familiarly acquainted with the process of tinning coppers, for the purpose of preventing the verdigrease corroding or poisoning the contents of a pot. Suppose a person should invent a copper vessel of a peculiar form, and line it with tin for the purpose of fusing some chemical preparation, which, but for the tin, would corrode the copper; supposing after that I tin an ordinary copper—is it to be said you have infringed my patent, because although it was a known thing to tin copper, for the purpose of preventing the copper from poisoning the food, the purpose for which I apply it to my patent is new, namely, to protect the copper from the contents of the pot? Why it is absurd. When you put those illustrations it shows the absurdity of it. Therefore the refined distinction my learned friend endeavoured to contend for must fail him. It cannot depend upon the purpose for which the tin is introduced. The question is, whether by introducing the tin we have infringed their patent at all; and secondly, whether by introducing the tin we have done anything that has not been perfectly well known, and perfectly well familiar to all parties heretofore. When I say perfectly well known, it is not necessary for me to show that. His lordship will tell you that if it has been used at all, so as to be publicly known, that is sufficient to deprive the patentee of any right of interfering with its use in future. It is not necessary that every engine-maker, that every manufacturer of machinery, should have known it or have practised it; but if I show that a certain number have without concealment in public places, in large factories, used the process, that is amply sufficient to establish its public use, and make it no longer the subject of a patent. And I say, if it has been used under these circumstances, and if it had the same effects, the object with which it was introduced—the purpose for which it was introduced—cannot make the difference in this or any other case.

Now, let us see; that being the state of the thing, what has been done? It is imputed to this Company, that at the time this patent came out, they devised every means of getting the full benefit of it, without paying for it. Why, gentlemen, is there really any pretence for anything of the sort? In the first place, one might almost assume, I think, it would be hardly worth the while for a Company of this sort to do any such thing; but did they do anything of the sort? Why, the whole correspondence shows that they did not, that they were willing to treat throughout, and always have been willing to treat with the Plaintiff for the purchase of his patent; and if they purchased the patent, if he had come to reasonable terms, as they thought he would, they would have purchased the patent, and used it in this form. But they did nothing of the sort. What they have done is, as it is described, as dissimilar as one thing could be from another. All that they can be proved to have done is, to have introduced no alloy, none of the things described in the specification, but to have introduced a small portion of tin into the bearings which are used for their locomotive engines. I say at once, it did occur to their officers, no doubt, Here is an invention; it may be advisable, if we can agree upon terms, to purchase the invention. But there is a part of it which is not at all new, if it can be called a part of it, namely, the mere tinning. The mere tinning is not in the least new. We will try an experiment, whether that does not to some extent prove an advantage. I have no hesitation in stating it never was concealed, it never was dissimulated, that they were making experiments to that extent. They had used, as other manufacturers had used, tin for the purpose of repairing bearings, for the purpose of filling up holes; no doubt, when it was used for that purpose, it had the double effect of filling up the holes, and also producing ease in working the machinery: they were conscious that was no new process, introducing tin into the bearings, and they were disposed to try; this person making demands upon them for his patent, which they thought exorbitant, requiring of them not merely payment of money, but requiring they should purchase materials of him for all time to come, however long the Company might exist, at least during the patent. They, thinking these demands exorbitant on the part of the patentee, did no doubt make experiments upon what they conceived, and what, I trust, you will be of opinion was a perfectly old practice, for the purpose of seeing whether it did not, to a certain degree, have the effect of easing the working of the machinery. And that is the whole that has been proved against the Grand Junction Railway Company. Is it to be said, because a man makes a clever invention, granted to be as clever as you please, by a combination of a number of things, some new, some old, that when that comes out, if it suggests to a man, "Here is part of this is quite old; it has never been applied for this purpose, it is true—(why, locomotive engines themselves are new, comparatively speaking,)—it has never been applied to bearings of locomotive engines, it is true; but putting tin into bearings is an old process, which is perfectly familiar to every man who knows anything about machinery,—why should we not try whether that will to a certain dergee ease the working?" Is it to be said that is an infringement of the patent? If that is all that has been done, which I undertake to show you, that that is really and truly the whole thing that has been done; I say, if that be so, if that be all that we have done, and if that part of the process be not new, but perfectly familiar, or has been used to such an extent as in law to constitute a public use of it, for which I have endeavoured to lay down the rule humbly under his lordship's correction, which rule you will probably receive from his lordship hereafter;—then, I say, that in this case, I can demonstrate the Company have in no degree infringed this patent. We have not used any part of the patent with the exception of introducing tin,—pure tin upon part of the inner surface of the bearing. That has been done, not by pouring in as in a mould; it has been done in the way described by one of the witnesses, by a hot iron, or something of that sort, something like a paint-brush.

Mr. Justice Cresswell.—His description of it was, taking a stick of tin, heating the outer brass, and rubbing the stick of tin to and fro upon it.

Mr. Wortley.—Like a paint-brush, working it in that way (describing it). Or like sealing-wax.

Mr. Justice Creswell.—More like sealing-wax.

Mr. Wortley.—In that way forming an irregular coating of tin, and when they cannot get it regular; sometimes using a soldering iron.

Mr. Justice Cresswell.—You may get it as badly as you please, but if you get it——

Mr. Wortley.—Yes, my lord, no doubt. I am not disguising that we introduce tin, but then I will satisfy you that has been in use before. There is evidence to that effect already. Mr. Fothergill states, in Messrs. Roberts's establishment it has been introduced into the bearings there. I will show you it has been introduced into other places for years. I can show you that for ten or twelve years it has been done by persons whom I have called before you; no doubt it was done by others before them: they have been in the habit of introducing this tin exactly in the same way.

I put this yesterday into the hands of Mr. Fairbairn (showing a model)—that has been in use twelve years. Mr. Fairbairn suggested that it was not a mould, not poured in, that it had been fitted. There is no pretence for any such thing. When I came to ask him to look at it again, he seemed to waiver in that opinion. Very lucky he did; for if he had ventured his credit at all, or his *skill*, upon that opinion, he would have been deceived. Here is a piece which has been the bearing of machinery, containing an alloy of tin which was introduced, and which has been worked for twelve years in the condition in which you see it in a public factory. The mode of putting it on, as my learned friend suggests, would be immaterial. But I am only making the observation on what Mr. Fairbairn said. Mr. Fairbairn said he saw no difference between these. He said he could not help thinking that had been fitted on, but he was obliged to admit he could see no difference between this and the introduction claimed as the invention of my learned friend. That is one instance; when you have that in your hand you will be able to judge whether that is not precisely a similar invention. Here again is a bearing in machinery, (showing a model,) and I will call before you the man who made and used this; and it was made in a very similar manner to what is described by this patent. This mandril or roller was introduced, there is that contrivance by the side of it, which answers to the aperture in the Plaintiff's plan, and which enabled him, when this mandril was placed there, to pour in the tin, and so formed a lining. That has been in use for six years, and I will prove to you, in the same factory there were fifty of them in use at the same time. Now, is not that so?

Mind you, gentlemen, we are now confined, because my lord has held, that if this part of the invention was new, that in infringing that part of it, we have, to a certain extent, infringed the patent, and so made ourselves liable; but the question is confined to this portion of the patent, there is no pretence for saying we have infringed any other portion of it, the thickness of the lining, the retaining any part of the mechanical contrivance, to this part alone is this infringement now confined. I say in these two instances are bearings used in machinery, having tin poured in in this manner, and introduced for the purpose, undoubtedly, at the time, I dare say, of making them fit more perfectly, but having no doubt, at the same time, continually, the effect this patent has of easing the machinery, preventing the frequency of repair, and the necessity of using an additional quantity of oil.

Again, here is another specimen (showing it) used in a public factory. There is the tin introduced as the lining under very similar circumstances. This I will prove to you has been used for ten years, under no secrecy, under circumstances no doubt constituting in point of law a public use.

These therefore, gentlemen, are instances in which the very same process has been resorted to. Again I say for different purposes. I care not whether the effect was the same, and my learned friend cannot rely upon that distinction. He felt the necessity of something of that sort to support his case at all, therefore he endeavoured to draw the fine distinction between the mode of application and the purpose for which it was applied. I say the purpose cannot vary the rights of the parties. If it was applied at all, and used, although the purpose was not the same, the effects were the same, though one of the effects was not at that time foreseen; it can make no difference whatever between the rights of the parties. I have an instance, also, where, I believe, it was deliberately introduced.

Gentlemen, I have an instance where I believe it was deliberately introduced for a double purpose, or, at all events, where it was introduced under circumstances so very nearly similar to these, that I am at a loss to distinguish it in detail, much more in principle. I will call before you a gentleman of the name of Hodge, a most skilful engineer, who for some years has been residing in America, where he has obtained considerable celebrity on this subject; but who was an Englishman, who previous to proceeding to America was employed in an engine-maker's here and in a manufactory of machinery, and among other things he had occasion to form a lathe for the purpose of turning iron, in which, as you are aware, there is great force used, necessarily great power and considerable rapidity; and it is of great consequence therefore to have bearings that work well: and in the bearings of that lathe which he at that time planned and framed, was introduced a lining of soft metal as nearly similar to this as can be, not merely consisting of a tin lining, but actually having rims and fillets to contain the tin lining under very similar circumstances. Nor was it confined to Mr. Hodge alone, for Mr. Hodge afterwards sold the lathe in London, and I believe he will tell you that he has seen others constructed exactly in the same way. Therefore, in point of fact, the application of a soft metal lining under these circumstances, so far from being new, was a thing he was perfectly familiar with, which he believes many other persons were familiar with. I regret, gentlemen, that I have not the plan which I proposed to show you and his lordship at this period; however, in the course of the evidence it will be laid before you, and you will have an opportunity of judging of that invention. That again is an instance—I believe this was some twelve or fifteen years ago—I do not know the exact time. Within this kingdom you have gentlemen who applied this principle of the softer metal in immediate contact with the journal, it having the effect of easing the operation, making it work with less heat and abrasion, and so easing the operation of the machinery. You will have the fact, he parted with it under ordinary circumstances in London, the most public of all places; and you will have the additional fact from him, he is not the only person who used them, but he has seen them in other persons' hands.

Taking these things together with the evidence of Mr. Fothergill, that this is used for the purpose of making the bearings fit in Messrs. Roberts's manufactory; the evidence of Mr. M'Connell that it was used in Glasgow, at Gurwood's manufactory, where he saw various instances in which tin or soft metal——"

Mr. Martin.—Only one instance.

Mr. Wortley.—Various instances in that one factory, where they had introduced tin or soft metal into the bearings of machinery under circumstances extremely similar.

Then, gentlemen, if I show this, do not I establish, beyond all possible doubt, this part of the invention was not new? This element, which is a mere and a trifling portion of the combination, displaying no ingenuity, such as is displayed by the particular arrangement which is the subject of this patent, for the purpose of retaining the metal in the box, do not I show this was entirely familiar, therefore not new? That is the only thing which we have in any degree infringed. If that be so, we are entitled to a verdict. Therefore I shall reduce my learned friend to this dilemma—either his invention consists of a peculiar combination, and of the fillets, which we have in no degree infringed, or he must insist upon, as that portion of his invention which we have infringed, the lining by a soft metal attached to the hard metal in the bearing, and that I shall show you is not new. What is new we have not infringed. What we have infringed is not new. If I make out that, gentlemen, I am entitled to your verdict. The two things which have been used as described are in their appearance dissimilar.

My learned friend talked about substantial damages. It is not pretended the slightest injury has been done to Mr. Newton; there is not the slightest evidence to show anybody has ever mistaken this, or supposed it to be the invention of the Plaintiff; nobody with their eyes open could mistake the two, and suppose one was the other, or had the least affinity to the other. So far from having been injured, my learned friend has had this opportunity of furnishing to all the world the benefit of his invention. He has proved, so far from the sales of his licences being diminished or limited, they have been extended throughout the country, and there is hardly a company that has a locomotive engine, who has not purchased his licence, and used it to the utmost extent. Where is the injury? And why is there no injury? Because it is nothing like the invention of the Plaintiff that we have used. If indeed we have made something, merely having a trifling deviation, but having the appearance of being the Plaintiff's, then indeed he might have complained. What we have done has no similarity, has no approach in appearance, to the invention which is claimed by the Plaintiff; and so far from having injured him in any respect, he has continually been increasing the use of this patent, he has never been checked. If he had made reasonable terms, no doubt that patent would have been established, and would have been adopted by the Grand Junction Railway Company, as well as all the other Companies from whom you have had the officers to give evidence, and his patent would have been as valuable as he would wish, or any other person could wish to have it.

But what we come to defend ourselves from, is not having come to an agreement for the purchase of his patent, because we thought his terms exorbitant; we have a right to do that; no man is bound to buy a patent,—what we are come to defend ourselves from, is the imputation of having used what we were willing to buy. We have done no such thing, we have used this tin, and tin alone, under the circumstances I have described to you; and in the correspondence it appears, that so far from this being anything like equivalent to the invention of the Plaintiff, which is said to be so advantageous in that same correspondence, it appears though we have used tin, which is at once avowed, we found it was of so little advantage, that the Company contemplate again resorting to brass. That is all that has been done.

Gentlemen, the question for you is, under all these circumstances, is that any infringement of this patent. Again I remind you, it is not a question with the Grand Junction Railway Company, it is a question with every manufacturer in this kingdom.

Mr. Justice Cresswell.—The only question here is with the Grand Junction Railway Company.

Mr. Wortley.—My lord says, the only question here is the Grand Junction Railway Company. But if they establish it to this extent against the Grand Junction Railway Company, I say there is no difficulty in establishing it against the other manufacturers in the kingdom, because by the very terms of this specification, they say it is to be applied to all kinds of machinery wherever there is a bearing, wherever there is a sliding rod; it applies therefore to every sliding rod, to every bearing in every cotton factory; in every woollen factory, in every machine-making factory, in every factory throughout this great manufacturing country, this question may apply; and I say that if this minute use of this alloy, part of the combination which is used in the patent of the Plaintiff, be established as an infringement, I say I do not know to what extent other manufacturers may be injured and embarrassed in their operations. It is quite manifest it will be impossible for Mr. Roberts safely to continue that practice which his workmen have adopted. Very likely that is the reason my learned friend shrunk from calling Mr. Roberts. It is impossible for Mr. Roberts to continue that practice, because they may say it has the effect of easing the operations of the machinery, by introducing soft metal, and that is the infringement of a portion of our patent. There is no doubt in these cases generally, every disposition to sympathise with the inventor, whether he be the original inventor, or whether he be, as in this case, the introducer of the invention into this country; there is always a disposition on the part of juries to sympathise with inventors; but on the other hand, where you have a case like this, where an invention is set up containing a combination of various elements, and you find all that is pretended is a trifling infringement of one of those elements which is found to be not new, and not really the invention of the party, if it stands alone,—I say then it becomes you, as I am sure you will be disposed to, to protect the interests of society and the interests of manufacturers in general from the embarrassments which may otherwise arise by a patent of so trifling and so unimportant a nature.

His lordship hints to me that is not a question of to-day; but it is suggested, and as I might suggest extremely doubtful, whether a patent for so trifling a thing as this be sufficient to support a patent at all. It is trifling: there is no invention in it, as I should be willing to contend under other circumstances and at other times, if it be necessary. Therefore, it does become extremely important to see so trifling an invention should not be made a matter of embarrassment to the manufacturers of the country.

Gentlemen, I have stated the case to you. I will call the evidence I have announced to you. You will hear the extent to which this has been used. I believe I shall establish that this process has been used quite sufficiently to constitute in law a public user; and if so, gentlemen, then I shall be entitled to your verdict, because all we have done is to take that portion which was known before, and which is no real invention on the part of the Plaintiff.

THOMAS RADCLIFFE SWORN.

Examined by Mr. Crompton.

Q. Are you in the employment of Messrs. Bowers, of Nantwich?

A. Yes.

Q. What are they?

A. They are cotton spinners.

Q. In what capacity are you in their employment: what do you do?

A. In the machinery line.

Q. How long have you been in their manufactory?

A. Going of nineteen years.

Q. In that same part of the business?

A. Yes.

Q. How long have you been engaged in that kind of business altogether?

A. Well; I have been in the mechanical line, you know, sir.

Q. How long; about how long?

A. What, in Nantwich?

Q. No, altogether; how long have you been engaged in mechanics?

A. Thirty years.

Q. Have you known of the application of tin lining to brass steps for machinery?

A. Yes.

Q. Have you applied tin yourself to brass steps?

A. Tinned them myself.

Q. Just look at this; tell me whether you know anything of this?—(Handing a model to the witness.)

A. Yes; I tinned this, and filled it up.

Q. Have you made many things like that you have in your hand?

A. Yes.

Mr. Justice Cresswell.—Like which?

Mr. Crompton.—Like what he has got in his hand.

Mr. Justice Cresswell.—He has got the mandril in one hand, and the other in the other.

Q. (*By Mr Crompton.*) Like to the metal thing,—have you made many things like that metal thing which you have in one of your hands?

A. Made many like this?—(Holding up the mandril.)

Q. Have you made many things like that metal thing you have in your hand?

A. Yes.

Mr. Justice Cresswell.—He is still talking of the mandril. —(To the witness.) Which do you mean you have made many of?

(*No answer.*)

Q. Can you understand my question? You say you have made many of them; which do you mean you have made many of?

A. These.

Q. The mandril, you mean—many mandrils?

A. Yes.

Q. (*By Mr. Crompton.*) Now look at the metal thing—the step—have you made many steps like that?

A. I have lined many a one of them, not made them—tinned them and lined them.

Q. For how many years do you think you tinned and lined steps of that kind?

A. Going of nineteen years.

Q. At present confine your attention to the step you have in your hand. Tell the jury, if you please, how you line and tin that step.

A. Yes, I will. In the first place, you know, when this step is wore down, I take it out; I take it down into my shop; I clean it; I tin it; I regularly tin it, you know, with my soldering iron, soft solder, and rosin.

Q. When you have done it with your soldering iron?

A. Very well, then; after that, I either put it in a pair of vice or clams.

Q. That is, to hold it?

A. Yes; then I get the size of my axle or journal, which you please to call it, then I turn my mandril or journal to the size, and get the length.

Q. When you have turned your mandril to the size of the axle or journal you want, what do you do with your mandril?

A. Then I take this (if it might be this), put it in my vice or my clams, then I melt my metal in a ladle, and I take this here—if it might be this—you know.

Q. That is your mandril?

A. Yes, of course it is. I take this, and I hold it half-circular, take my hot metal, and pour it in. There it is done; it is fast.

Q. I see on the side of the mandril there is a hole?

A. There is where the metal goes in.

Q. That is where you put in the metal?

A. Yes; I hold it in this way. Then I take my ladle, and I pour in the metal; then I fill it up, and clean it up, and fit it up with my mandril or axle, and put it to work.

Q. Now, about how many of that kind of things do you think you have made?

Mr. Justice Cresswell.—He does not say he has made any.

Mr. Crompton.—He has tinned them, then?

Mr. Justice Cresswell.—Yes.

Q. (*By Mr. Crompton.*) How many of those things have you operated upon in tinning?

A. Well, I have been in the habit of it for these thirty years, of tinning and lining up the brass.

Q. (*By Mr. Justice Cresswell.*) You have been in the habit of repairing machinery in that way for thirty years?

A. Yes.

Q. You said nineteen before?

A. In one place—that is, at Nantwich. I have been there going nineteen years, and I have been in the habit——

Q. (*By Mr. Crompton.*) When you had done that tinning upon them, were they used in the machinery afterwards?

A. Exactly so; after I have tinned and lined them up, I put them to work.

Q. Have you known machinery tinned in the same way in other places besides where you have been working yourself?

A. Yes.

Q. When you put this tin upon the bearing, what is the effect as to the friction or heat?

A. Well, I cannot say exactly; it depends upon the speed.

Q. Take a high speed; suppose the speed is very high?

A. Well, suppose, I will say, one thousand times in a minute, that is what we have at our place now going regular.

Q. Supposing that speed, what would be the effect of lining these bearings with tin, as to the friction and the heat?

A. As to that, I cannot say.

Q. Look at that one. Do you know that (handing a model to the witness)?

A. Yes, I do; and I did that. I tinned this and lined it up, and put it to work, and it has been at work eight years.

Q. That very thing?

A. Yes.

Q. How was it made; was that made in the same way that you have told, or in some other way? Just look at it again; how was that lined?

A. I will tell you how it was lined. When it was wore down to that depth, I took it out. I took it into my shop, I cleaned it, I tinned it with my soldering iron—soft solder. Very well; after that, I put it either in a pair of vice or a pair of clams: then I melted my metal; I got my mandril, and got it filled.

Q. The same way as the other?

A. Yes; and I ran it, and there it is.

Q. What kind of machinery were these bearings used for?

A. Carding engines.

Q. Do you know that (handing a model to the witness)?

A. Yes; this belongs to the concern.

Q. What is that?

A. This is a brass belonging to a beater that runs one thousand times in a minute.

Q. What is a beater?

A. A beater is to drive the cotton through the machine before it is carded.

Q. Is that of great velocity?

A. Yes.

Q. Is that a bearing of some part of the machinery?

A. This beater is one bearing. Very well; then there is another at the other end—I may say here; then there is two pulleys run here, two straps.

Q. Without going into the particular machinery, tell me what you did to that bearing.

A. I tinned this, and lined it, and put it to work in a proper manner.

Q. Is the lining done in the same way as you told us of the other, putting the mandril in and pouring in the metal?

A. Yes.

Q. It is done in the same way as the other?

A. Yes.

Q. That has been at work since?

A. Yes.

Q. You have spoken now of three bearings; about how long is it since you did the tinning to them?

Mr. Justice Cresswell.—He said one had been working eight years.

Mr. Crompton.—One of these bearings, my lord?

Mr. Justice Cresswell.—Yes, one that has been produced.

The Witness.—That has been at work eight years that that gentleman has got in his hand now.

Q. (*By Mr. Crompton.*) Is that another made in the same way (handing a specimen to the witness)?

A. Yes, tinned and lined, just in the same way as the other, and been at work eight years.

Q. Besides those four that you have had in your hand, have you had many in your manufactory tinned in the same way?

A. Yes.

Q. I think you say you have known others besides in other manufactories?

A. Yes, I have, down in Staffordshire.

Cross-examined by Mr. Baines.

Q. Then this was the way in which you repaired these things, was it?

A. Yes.

Q. Pray who makes machines for the persons in whose employment you are—who is the machine-maker for them?

A. Mr. Gower, of Manchester.

Q. And who are your employers?

A. Messrs. Bower and Company.

Q. Are Messrs. Bower and Company, or any of them, here

A. No.

Q. What is your department in their business?

A. Turning, filing, and repairing.

Q. How long has that been working? just look at it; that is the first one. (Handed to the witness.)

A. This has not been working long, because this has been melted out.

Q. That has not been working?

A. This has been fitted up and melted out, to show the tinning.

Q. (*By Mr. Justice Cresswell.*) What do you say?

A. The metal has been melted out of that to show the tin.

Q (*By Mr. Baines.*) When was that done?

A. I should think it is four years ago.

Q. Melted out of that, to show the tin—why was it melted out four years ago to show the tin?

A. About four years ago it has not been melted out—it was melted out to show the tin.

Mr. Justice Cresswell.—I understand you to say it was made four years ago, it has lately been melted out.

Q. (*By Mr. Baines.*) When was it melted out?

A. I cannot say exactly how long it is.

Q. About how long?

A. I cannot judge at all.

Q. But you have been talking here to eight or ten years—about how long is it since that was melted out?

(*No answer.*)

Q. Come, now; do not detain my lord and the jury all day; about how long is it since that was melted out?

A. Well, I will say a fortnight.

Q. What, you could not recollect a fortnight. Who gave you directions to melt it out a fortnight since?

(*No answer.*)

Q. Aye—come, you can think and recollect that if you try; who told you a fortnight since to melt that out?

(*No answer.*)

Q. Come, sir, come.

A. I had no regular orders to melt it out, I melted it out myself.

Q. (*By Mr. Justice Cresswell.*) But who told you to do that?

(No answer.)

Q. Do not keep us waiting: who told you do it?

A. To melt it out?

Q. Yes.

A. Myself.

Q. Do you take your master's machinery to pieces without orders?

A. No.

Q. Who asked you to do it?

A. He told me to do it.

Q. Who?

A. My master.

Mr. Justice Cresswell.—Why did you not tell me that at first?

(*By Mr. Baines.*) Are you quite sure now who it was that told you to take it out?

(*No answer.*)

Q. Come, come; are you sure now who it was?

A. Told me to take it out?

Q. Yes,—who?

A. Why, my master, of course.

Q. My master of course—not of course.

Q. (*By Mr. Justice Cresswell.*) Who was your master that told you to do it? give us the name.

A. Mr. Bower.

Q. (*By Mr. Baines.*) Has that ever been used? take that into your hand.

A. Yes.

Q. When was that used?

A. It has.

Q. When was that used?

A. Many a year.

Q. Since it was tinned?

A. Yes.

Q. That has been used many a year?

A. Yes.

Q. Since it was tinned?

A. Yes.

Q. Then it has been a common thing, has it, in your manufactory, to mend this thing in this way?

A. Precisely so.

Q. And you have known it in many others?

A. Yes.

Q. And it is very well known?

A. Yes.

Q. Perfectly well known to any person who knows anything about machinery; this is the way to do it?

A. I have done it many a year.

Q. I say it is perfectly well known to any persons who have anything to do with machinery, that this is the way to do it?

A. Yes.

Q. Did you ever make a new one in that way?

A. No.

Q. How far are you in your place from a brass founder's, or the persons who supply you with brass?

A. There is none nearer our place than Manchester, or Middlewich.

Q. How far is that to your place, the nearest?

Mr. Justice Cresswell.—The nearest what?

Q. (*By Mr. Baines.*) The nearest place where they get supplies of brass. I asked how far is it?

A. The most of the brass we have, we get from Manchester.

Q. How far are you from Manchester?

A. Thirty-six miles by the road.

Q. Why was it you did this in this way, that you poured this in in this way; why did you do it?

A. To save metal.

Q. To do what?

A. To save metal.

Q. How to save metal?

A. Because it will wear longer, metal will, than what brass will.

Q. Do you say it was worn at the time you put it in?

A. Yes.

Q. And what is it you put in?

A. Block tin.

Q. What other persons are there in your establishment that have done it?

A. Well, there are no others but me at that concern that does it.

Q. When were you first applied to to become a witness here?

(*No answer.*)

Q. When were you first applied to to become a witness here—first asked about these things?

A. I came here on Sunday.

Q. But when were you first spoken to about giving evidence here—about being a witness?

A. Monday week.

Q. Who came to you about it?

A. Mr. Allen and Joseph Heskith.

Q. Is Allen the man we have heard of as the foreman of the Grand Junction Railway Company, he is employed, is he not, by the Grand Junction Company?

A. Yes.

Q. Is he now here in court?

(*No answer.*)

Mr. Justice Cresswell.—Do not keep us five minutes between each answer.

Q. (*By Mr. Baines.*) Is he now here in court?

A. Yes.

Re-examined by Mr. S. Wortley.

Q. You say you took this out by direction of Mr. Bower your master?

A. Yes.

Q. Was that for the purpose of making an experimen

A. Yes, tinning and lining up.

Q. Take this into your hand; you say that was melted out?

A. Yes.

Q. Was it melted out before Mr. Allen came to you?

A. Yes, before Mr. Allen saw it it was melted out.

Q. (*By Mr. Justice Cresswell.*) Who told you to melt it out?

A. My master.

Q. (*By Mr. Wortley.*) Did you learn from your master that it was for the information of the Company?

Mr. Baines.—No, no; that will not do; if you have got the aster call him.

Q. (*By Mr. Wortley.*) Before it was melted, was it like that one? (Handing a specimen to the witness.)

A. Yes, the metal was in it like this before it was melted out.

Q. And you say it was melted out in order to show the tin?

A. Yes, of course.

Q. You say you were the only maker of machinery at that manufactory?

A. I do not make it, I only repair it.

Q. You were the engineer, and did the repairs to the machinery?

A. I did repairs to the machinery.

Q. Had you any man to help you,—any workman?

A. Yes.

Q. How many?

A. Only one.

Q. Did you put the machinery together?

A. No.

Q. When it was repaired did you put it together again?

A. No; when machinery comes to our place, there comes a man from Manchester to put it up.

Q. When you repair it, do you put it together again?

A. After I repair it I put it together,—put it to work.

Q. In the factory?

A. Yes.

Q. Up in the public room?

A. Yes.

Q. Now, besides these particular specimens, have you seen numbers of similar ones—in your own factory to begin with?

A. Yes, before I came to Nantwich.

Q. Before you came to Nantwich you have seen them too?

A. Yes.

Q. How many have you done in your own factory, in this of Bower's?

A. I have been there going nineteen years, and I have never missed a week but what I have had some of these pieces brought to me to do.

Q. (*By Mr. Baines.*) Never missed a week?

A. I have not missed one week. I have been agate now this summer, four o'clock in the morning until half past eight at night, tinning and lining up brass.

Q. (*By Mr. Wortley.*) Is Mr. Bower's factory a large one?

A. No, not a very large one.

Q. How many hands does he employ?

A. Well, I cannot say exactly how many he employs.

Q. Well, but about 500, or 600?

A. No, not so much as that.

Q. About how many?

A. We will say 400, or less.

Mr. Justice Cresswell.—Not more or less.

Mr. S. Wortley.—I do not know why my learned friend, Mr. Martin, is bursting out into a laugh.

Mr. Justice Cresswell.—I hope, Mr. Wortley, you will not ask me why.

Mr. S. Wortley.—I am afraid that paroxysm that seized him in Mr. Fernihough's evidence is coming on again.

Mr. Martin.—What is it?

Mr. S. Wortley.—A paroxysm of irregularity.

Mr. Justice Cresswell.—Let us go on with the cause.—I am losing time while you are laughing.

Q. (*By Mr. Wortley.*) Are there a great number of bearings in the machinery in their factory?

A. Yes.

Q. Many hundreds, I suppose?

A. Yes.

Q. Do you find that by repairing them with this soft metal they wore longer than if the brass was renewed?

A. Yes they do.

JOSEPH HESKITH SWORN.

Examined by Mr. Cowling.

Q. Are you in the employment of the Grand Junction Railway Company?

A. Yes.

Q. Where at, Crewe?

A. Yes.

Q. In what capacity are you in their employment?

A. As joiner.

Q. Were you formerly in the employment of Messrs. Bower, of Nantwich.

A. Yes.

Q. How long ago was that?

A. It was in 1830.

Q. (*By Mr. Justice Cresswell.*) In what capacity?

A. At the time I was in Mr. Bower's employment I was employed to assist in repairing machinery.

Q. (*By Mr. Cowling.*) How long did you remain there?

A. From nine to twelve years, I cannot speak exactly to a month.

Q. Was the last witness there at the time?

A. Yes.

Q. You speak of assisting in repairing machinery?

A. Yes, assisting Radcliffe in repairing machinery. I assisted Radcliffe in taking down and repairing certain portions of the machinery.

Q. Did you assist him when he was engaged in lining any part of the brass steps?

A. Yes.

Q. Did you hear the evidence he has given this morning?

A. Yes.

Q. Did he line the steps in the way he has described this morning?

A. Yes.

Q. Look if you please, and tell me which of those you saw lined?—(Pointing to the specimens.)

A. I did not see him line any of those to my knowledge.

Q. Any of those,—were those he lined of the same kind, or what were they?

A. They were like unto this, some larger and some smaller.

Q. Did you see him line only one or two, or several?

A. I saw him line many a one.

Q. Were they afterwards used in the works?

A. They were, I assisted him in replacing them again in their old situations.

Q. Have you seen any other steps lined in a similar manner elsewhere?

A. Yes.

Q. Where?

A. Whitechurch, in Shropshire.

Q. (*By Mr. Justice Cresswell.*) At what place?

A. At Messrs. Hassell and Company.

Q. (*By Mr. Cowling.*) What are they?

A. It was a silk factory where I saw them at.

Q. How have you seen them; were they in use, or how were they?

A. They had all been in use that I saw lined.

Q. In the silk mill?

A. Yes.

Q. And how long ago is that?

A. Nine to ten years, I cannot speak exactly to a year.

Cross-examined by Mr. Martin.

Q. I think you say they had all been in use that you saw lined—old bearings—old steps?

A. Yes.

Q. How long have you been in the service of the Grand Junction Railway?

A. About two years and a half, since 1843.

Q. What time of the year 1843 was it?

A. 6th March.

Q. 6th March 1843?

A. Yes.

Q. I suppose you found the Grand Junction Railway Company busy at work lining all the steps when you went there?

A. No I did not; there were no mechanics at the time when I went there.

Q. What were they doing?

A. They were getting the works in a state of preparation for their reception.

Q. You went to work as a carpenter and joiner there?

A. Yes, as a joiner.

Q. When did you first see the Grand Junction Railway Company at work on this?

A. It would be perhaps in the ensuing month, March or April.

A. You saw them at work lining tin?

A. No.

Q. I ask you when did you see the Grand Junction Railway Company at work, lining brass with tin?

A. I never saw them lining brass with tin.

Q. You never told them anything about these things you had seen at Bowers and Hassell?

A. Yes.

Q. When did you tell them that?

A. About a fortnight since.

Q. Do you mean that you had never mentioned it until about a fortnight ago?

A. Never.

Q. Never?

A. Never, to my knowledge; I cannot charge my memory.

Q. Whom did you tell it to?

A. To Mr. Allen.

Q. Did Mr. Allen come to enquire of you, or how was it?

A. No, I heard there was an action against them for tinning brasses.

Q. You went and told them what you had seen done?

A. I considered myself in duty bound to do it.

Q. You say you never saw them tin at all?

A. No.

JOHN PARKINSON SWORN.

Examined by Mr. S. Wortley.

Q. What is your business?

A. A mechanic, originally.

Q. Did you formerly work at Messrs. Parkinson's, at Bury?

A. I did.

Q. What was that factory; what sort of factory was it?

A. It was a brasiery, and brass-foundry, and tinning establishment—tin-plate working establishment.

Q. Was there any machinery there in which bearings were used?

A. Yes.

Q. Did you ever, while you were there, introduce tin or tin alloy into the bearings?

A. No.

Q. Did you see it done?

A. Yes.

Q. Who by?

A. My father.

Q. What was his name?

A. Lawrence Parkinson.

Q. Is he dead?

A. Yes.

Q. How long is that ago?

A. About fifteen or sixteen years—sixteen years: it may be seventeen.

Q. Was it tin, or tin alloy?

A. It was tin.

Q. In what way was it introduced?

A. I will describe it, if you will furnish me with a bearing. —(It was handed to the witness.) The steps that they used were shorter bearings than this in breadth, and about the same in diameter: they vary in diameter. The reason they used tin, was in consequence of having bearings to fit, or having pivots to fit in the same bearings of various sizes; and it would have incurred considerable expence on the establishment, had they had bearings to suit every particular arrangement; in consequence of that, they adopted the method of tinning them up to suit these particular sizes. The purpose they were used for, was for turning copper rollers off for calico-printers.

Q. (*By Mr. Justice Cresswell.*) If I understand you right, you had but one size of casting?

A. One or two.

Q. And because your journals were of a different size, when you had a smaller journal you filled in with tin?

A. Yes.

Q. To make it fit?

A. Yes.

Q. (*By Mr. S. Wortley.*) How was the tin introduced?

A. The tin was introduced by first tinning, as has been described this morning, by that method. It goes through the hand of the brasier, or the tinner, then it came to my father, and he made what is termed a core, that is a casting in sand similar to the core described this morning, but made of sand that the moulders use; then it was moulded in a peculiar form, which I am not capable of describing at present. I was too young to describe the particular method; it was introduced into the sand—this core—the core placed in its right position, and the tin poured into it.

Q. And the sand formed the core or mandril?

A. Formed the mandril.

Q. Have you known many of these done in that way?

A. Yes, it was frequently done.

Q. Were they constantly tinning in that form in the factory?

A. It did not happen very often.

Q. But when they were used, they were used in the factory —were they publicly?

A. Decidedly.

Q. In the ordinary process of manufacture?

A. Just so.

Q. Have you known that use made of the introduction of tin elsewhere?

A. Yes.

Q. Where?

A. I have done it myself since.

Q. Where?

A. At Grimes' establishment, at Bury.

Q. What establishment is that?

A. They were engravers to calico-printers, but they have failed since.

Q. Were you employed there as a mechanic?

A. Yes.

Q. Under what circumstances did you introduce the tin there in the bearings?

A. I introduced it in a similar way, and with a view to take the friction off.

Q. When was that; how long ago?

A. Ten years ago; not so much, say eight years ago.

Q. About eight or ten years ago?

A. About eight or ten years ago.

Q. Did you do that to any extent?

A. I did it for all the bearings that I required; it was but a very limited establishment.

Q. Did you introduce the tin in the same way that you described your father did?

A. No, I introduced an iron mandril.

Q. Something like that (pointing to a model)?

A. No, merely a straight mandril, similar to the core I have described, and fastened the ends up with clay.

Q. And then poured it in like a mould?

A. Just the same.

Q. Did you find that that did diminish the friction?

A. Considerably; I had a very nice way of testing it.

Q. And diminish the heat, did it?

A. There was no heat at all; there was no heat in the case of brass under these circumstances.

Q. Is there any other place where you have known it done?

A. Yes, I have seen bearings work.

Q. Where?

A. Mr. Kay's establishment, where I served my time.

Q. Where is that?

A. Mr. Kay's, at Bury, the engine manufacturer.

Q. Seen bearings with tin lining there, have you?

A. With tin lining.

Q. Anywhere else?

A. No.

Cross-examined by Mr. Baines.

Q. Mr. Kay is an engine-manufacturer at Bury?

A. Yes.

Q. In a large way?

A. Rather.

Q. Were you in his employment then?

A. I was.

Q. For how long?

A. For about four years; betwixt four and five years.

Q. Is there anybody from his establishment here?

A. Not that I am aware of.

Q. At Bury, this is?

A. Yes.

Q. I suppose Mr. Kay was fully aware of this?

A. I do not suppose he was.

Q. (*By Mr. Justice Cresswell.*) You do not suppose he was aware of that?

A. No, he did not take any active part in the business.

Q. (*By Mr. Baines.*) But his foreman, then, he would know?

A. Yes.

Q. Is he here?

A. No.

Q. What is his name?

A. James Palmer.

Q. Who did superintend the business?

A. James Palmer, that part of the business—the machine-making.

Q. Which is this department you are now speaking of?

A. Yes.

Q. He is not here, I understand you to say?

A. No.

Q. How old were you at the time your father did the thing you first mentioned?

A. About fifteen years of age.

Q. What were you bred up as—to what business?

A. To a mechanic.

Q. With whom?

A. With Mr. Kay.

Q. With this Mr. Kay?

A. Yes.

Q. What was the next place you went to?

A. I went to Dublin.

Q. What were you there?

A. I was working there as an engineer—a general fitter.

Q. You did this same thing there?

A. No.

Q. You did not do it there; you then went to Mr. Grimes's, did you not?

A. Yes, when I came back again to England.

Q. Were you at a person's of the name of Parkinson before you went to Grimes?

A. I was, before I was anywhere else.

Q. What was Parkinson?

A. A tinner, brasier, and brass-founder.

Q. Is he here?

A. He is dead, some time since.

Q. It was the same Parkinson you are speaking of. Now Grimes was an engraver, was he?

A. Yes.

Q. Did you do it, then, to his knowledge?

A. Well, I fancy he knew of it.

Q. Fancy he knew of it?

A. I should think he did.

Q. Have you any doubt about that?

A. I should say he did know of it.

Q. Then you are sure he did, are you?

A. I should say he did.

Q. I ask you, are you sure he did? Must he have known f it?

A. To the best of my knowledge he did.

Q. Is he here?

A. He is not that I am aware of.

Q. Is there not a person of the name of Parkinson, a brother of yours in the employment of the Grand Junction Railway Company now?

A. There is.

Q. Is he here?

A. He is.

Q. What is he with them?

A. A brasier and copper smith.

Q. Did you go to any place after Grimes's, before you got to Kay's?

Mr. Justice Cresswell.—No, he went to Kay's first, he served his time at Kay's.

Q. (*By Mr. Baines.*) That was so, was it; you served your time at Kay's?

A. With Kay's.

Q. It was before that you saw your father do what you have been describing?

A. Yes.

Q. Have you been at any place since Grimes's.

A. Yes.

Q. Whose?

A. Hardiman and Price's, calico printers at Bury.

Q. What were you there?

A. I was in a branch of the engraving called tool raising; it is a mechanical business.

Q. I suppose you did the same thing there too?

A. I did not.

Q. Have you been at any other place?

A. No.

Q. Have you been about to the witnesses to get up evidence for this case, for the Grand Junction Railway Company?

A. I have called at a place or two.

Q. How many places or two have you called at think you?

A. Four.

Q. Where did you call?

A. I called at Mr. Kay's in Bury.

Q. What, at your old masters?

A. I did.

Q. You called at Mr. Kay's then?

A. Yes.

Q. Where else did you call?

A. I called at Mrs. Broadbents, in Oldham; I had set up machinery there several years since, and I suspected there was something of the sort.

Q. Had you done this at Mrs. Broadbent's?

A. No; I had set up some machinery of Mr. Kay's of Bury, at Mrs. Broadbent's.

Q. Where else did you call?

A. Mr. William Lee's, at Oldham.

Q. Is there any body from his place here?

A. Not that I know of.

Q. Where else did you call?

A. I called at Lee's and Barnes.

Q. Anybody from their place here?

A. No.

Q. Have you called anywhere else for the purpose of getting evidence?

A. No.

Q. Have you applied to any witness to come—any persons to come and give evidence here?

A. To come?

Q. Yes, think about it a moment?

A. Yes.

Q. Whom?

A. I applied to one of Mrs. Broadbent's Mechanics.

Q. What is his name?

A. ild.

Q. Is he here?

A. Yes.

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Q. Whom else have you applied to?

A. A person of the name of Mason.

Q. Who is he?

A. He is a tinner.

Q. Where from?

A. Manchester.

Q. Is he here?

A. Yes.

Q. Whom else?

A. I never applied to any one else—not to come merely inquiring.

Q. One from Oldham, one from Manchester, and these four places that you called at?

A. I did not ask them to come; merely called to see whether the thing was in existence or not.

Q. To see what they can say?

(*No answer.*)

Re-examined by Mr. S. Wortley.

Q. He does not say to see what they can say; what object did you call upon them for?

A. To ascertain whether the thing was practised in their establishment or not.

Q. Was it you who applied to Mrs. Parkinson for the old steps?

A. No.

Q. You do not know whether they were refused?

A. I understand they were refused.

Q. (*By Mr. Baines.*) Do you know anything about them?

Mr. Justice Cresswell.—No: you cannot ask that.

Mr. Wortley.—The lady refuses to give them; I shall call the person who was refused.

Mr. Justice Cresswell.—No, no, Mr. Wortley.

Q. (*By Mr. Wortley.*) Mr. Parkinson, you say, is dead?

A. Yes.

Q. Mrs. Parkinson did not interfere in the management at that time?

A. No.

After the witness had left the box—

Mr. Wortley.—Let that witness come back.

John Parkinson re-called.

Mr. Wortley.—You say you have a brother in the service of the Company, who is a brasier and coppersmith?

A. I have.

Q. Did he know you had been in the habit of using those steps lined with tin?

A. Yes.

Q. (*By Mr. Justice Cresswell.*) When did you tell him?

A. I told him when he called at our house; perhaps it is three weeks or a month since; he asked me the question. I said I had been in the habit of using it, and seen it used frequently.

Q. (*By Mr. Wortley.*) That is not what I want to know Had he the means of knowing it; when you were a young man, and working at those places, used he to visit you at those places where you were working, or not?

A. I should say very seldom.

Q. Has he, or not, had opportunities of knowing it?

A. Decided opportunities of knowing it; because we have been frequently in conversation, and it has been generally understood.

Q. (*By Mr. Justice Cresswell.*) Do not talk about what is generally understood. Did you ever tell your brother you had been using them, or not?

A. Yes.

Q. When?

A. I cannot recollect the time.

Q. How long ago?

A. About six or seven years ago, at the time I was using them. I have not made any since.

THOMAS BARLOW SWORN.

Examined by Mr. Crompton.

Q. Were you in the employment of the late Mr. William Parkinson, of Bury?

A. Yes.

Q. Did you know of the lining of steps with tin there?

A. Yes.

Q. Did you hear what the last witness said about it?

A. Yes.

Q. Were they lined in the way he said?

A. I never saw them lined in that way.

Q. Have you seen them when they have been lined?

A. I have seen them lined, but I never saw them lined in that manner.

Q. In what manner did you see them lined?

A. With the soldering iron.

Q. In what part of the business were you employed?

A. As a turner.

Q. Who did you see do them with a soldering iron?

A. The braziers.

Cross-examined by Mr. Martin.

Q. Did you ever see, at Mr. Parkinson's, steps tinned in the manner the last witness spoke of?

A. I never saw them tinned in the manner the last witness spoke of.

Q. Did you ever see them tinned up, except that you occasionally botched up an old step in that fashion?

A. They were always botched up in that way.

Q. They were always botched up in that way?

A. Yes, an old step botched up in that way.

Q. Was it when an old step got out of repair, and you had not a new one at hand, that this was occasionally done?

A. Yes, the reason we had them done with tin was to fit different-sized journals.

Q. If you required a different-sized journal to work in an old step, you filled it up with tin to make it fit well?

A. Yes.

Q. Was that because you wished to avoid the trouble of making a new brass step for it?

A. Yes.

Q. Did you ever know any tinned for sale?

A. No.

Q. Or for any other purpose than that you have just mentioned?

A. Never.

Q. And I think you have told my lord and the jury the manner in which it was done was quite different from that which the witness spoke of.

A. Yes.

Re-examined by Mr. S. Wortley.

Q. How long ago is it since you were there?

A. Since I have been in their employment?

Q. Yes; are you in their employment now?

A. Yes, I have been nineteen years—better than nineteen years.

Q. Do you remember who the braziers were, you saw doing it?

A. Yes.

Q. Who were they?

A. Do I know their names?

Q. Yes.

A. James Crompton and Matthew Parkinson.

Q. Not old Laurence Parkinson?

A. I never saw Laurence.

Q. Perhaps he was not there when you went?

A. Yes, he was there before I went.

Q. Were you there with him?

A. Yes.

Q. The person you saw do it was not Laurence?

A. No.

Q. Do I understand you—you say you were a turner?

A. Yes.

Q. Were those used in the steps of your lathe?

A. Yes.

Q. For whatever purpose they were introduced, did you find that they wore well?

A. Yes, they wore very well.

Q. Was there much heat or friction in the steps of the lathe?

A. They did not heat so much as if they were done on the brass metal by itself.

Q. Did you find that an advantage in the mode of repairing them?

A. Yes.

Q. That they did not heat so much as the brass?

A. Yes.

Q. Do you know whether Mrs. Parkinson refused the steps when she was applied to for them?

A. No.

Mr. Justice Cresswell.—You cannot, Mr. Wortley.

Mr. S. Wortley.—He is in their service.

Mr. Justice resswell.—Suppose that she did.

Mr. S. Wortley.—It is only to account for not producing them.

Mr. Justice Cresswell.—First prove that she has got them.

Q. (*By Mr. Wortley.*) Were there not some steps lined with tin on her premises lately?

A. Yes.

Q. I believe she refused to let them be seen by the person who came on behalf of the Company?

Mr. Martin.—How can he know—he is in Sharpe, Roberts, and Company's service.

Mr. S. Wortley.—No, he is not, he is in Mrs. Parkinson's.—(To the witness.) Do not you know when they applied to her to let them come, she refused?

A. Yes, I believe she did.

Mr. Martin.—Will your lordship ask the witness, was the tin in contact with the revolving shaft at all, or was it in grooves to attach the layer of metal to the original brass?

Q. (*By Mr. Justice Cresswell.*) Was the tin used in these steps in contact with the revolving shaft or journal?

A. Yes.

Mr. Justice Cresswell.—It could not otherwise have diminished the heat or friction.

Mr. S. Wortley.—No, of course, my lord.

WILLIAM MASON SWORN.

Examined by Mr. Cowling.

Q. What are you—a tin plate worker?

A. Yes.

Q. Where—at Manchester?

A. Yes.

Q. Are you on your own account?

A. No.

Q. Then with whom are you?

A. Messrs. Marsh and Shears.

Q. And what are they—tin plate workers?

A. Tin plate workers and braziers.

Q. Have you known of brass steps being lined with tin?

A. Yes.

Q. How long have you known that?

A. Fourteen years.

Q. Have you done it yourself?

A. Yes.

Q. How long ago?

A. Six years.

Q. (*By Mr. Justice Cresswell.*) Six years ago?

Q. (*By Mr. Cowling.*) How long ago have you done it yourself?

A. Six years since I did it.

Q. (*By Mr. Justice Cresswell.*) You have not done it for the last six years, you mean?

A. No.

Q. (*By Mr. Cowling.*) Have you got a specimen there?

A. No I have not.

Q. Just describe, if you please, how it was you lined it.

A. With a soldering iron.

Q. Just describe it,—you lined the step with the soldering iron?

A. Yes, I tinned it, then laid the metal on it.

Q. You first applied the soldering iron, then the metal upon it?

A. Yes, tinned the step first, then applied the metal to it, —block-tin.

Q. How did you apply the block-tin upon it?

A. With the soldering iron.

Q. You first tinned it, then applied the block-tin with the soldering iron?

A. Yes.

Q. To what purpose were those brass steps applied when they were so done?

A. Indeed I did not ask the question of the people who brought the step. I did not ask them what part of the machinery it belonged to.

Q. When those brass steps were lined in this way, what became of them?

Mr. Justice Cresswell.—It seems the people brought them to him to his tinning place, they told him to tin them, and he did.—(To the witness.) That is all you know about it?

A. Yes.

Q. (*By Mr. Cowling.*) The people took them away when you had tinned them in this manner?

A. Yes.

Q. Have you done many of that kind?

A. Yes.

Q. For how long a period did you do this?

A. Why, for about four years.

Q. Then during that four years did you tin great numbers in the way you have mentioned?

A. Yes.

Q. Perhaps you can tell from looking at the steps, for what sort of machinery they were used—could you, or not?

A. No.

Cross-examined by Mr Baines.

Q. You say you did it for about four years—how long ago is it since you did it last?

A. Six years.

Q. You were with Messrs. Marsh and Shears?

A. Yes.

Q. What are they?

A. Tin-plate workers and braziers.

Q. And did you do this with their knowledge?

A. Oh, I did not do it while I was there, it was at the time while I was at Oldham.

Q. Who were you with at Oldham?

A. I was in business for myself.

Q. (*By Mr. Justice Cresswell.*) At the time when you did this, you were in business for yourself?

A. Yes.

Q. In what capacity—what business did you carry on?

A. The tin-plate-working line.

(*By Mr. Baines.*) How long were you there at Oldham?

A. It was about five years.

Q. Did you give up being a master for yourself?

A. Yes.

Q. And then came to Marsh and Shears?

A. No.

Q. Where did you go to then—what became of you then?

A. Now I have worked at Liverpool.

Q. As what?

A. Tin-plate worker.

Q. Is it making pots and pans?

A. Yes.

Q. Now you have got to Marsh and Shears?

A. Yes.

Re-examined by Mr. Cowling.

Q. Did you say you left Oldham about six years ago?

A. I left in 1839.

Q. Did you tin these brass steps up to the time you left Oldham?

A. Yes.

Q. And since then you have been elsewhere?

A. Yes, I have.

Q. (*By Mr. Justice Cresswell.*) Who were the people you say brought them to you—were they people from the different mills?

A. Yes.

Q. Just brought in a step, and told you to tin it?

A. Yes.

Q. How did you know how thick to tin it?

A. They always told me what quantity of metal they wanted on it.

JAMES WILD SWORN.

Examined by Mr. Crompton.

Q. Are you in the employment of Mary Broadbent and Son?

A. Yes.

Q. They are dyers at Oldham?

A. No, cotton spinners.

Q. In Oldham?

A. Yes.

Q. Now, in your manufactory, have they used brass steps lined with tin?

A. Yes.

Q. How long have you known steps of that kind lined with tin, being in use there?

A. For six years.

Cross-examined by Mr. Martin.

Q. What is your business?

A. A mechanic.

Q. What sort of mechanic?

A. Jobbing.

Q. Jobbing in what?

A. In repairing machinery.

Q. Was it repairing old brass steps with tin that you have known done?

A. No, we sent them to the tinners.

Q. (*By Mr. Justice Cresswell.*) Well, well; but what the gentleman asks you is this, were the steps that were so tinned old brass steps repaired with tin?

A. Yes, they were repaired with tin, the tinner soldered it on, and we put them on again.

Q. (*By Mr. Martin.*) Did you ever see any coating of brass or copper upon the top of the tin?

A. Yes, I have seen it in that way, over the tin.

Q. In fact, they soldered one piece of brass to another piece of brass?

A. Yes, I have seen that done.

Q. (*By Mr. Justice Cresswell.*) You have seen sometimes tin put on, then brass upon that?

A. Yes, I have seen that done.

Q. (*By Mr. Martin.*) Is that what you have seen done, —what was generally done?

A No, not generally; we have only about three instances —three to the best of my recollection.

Q. You mean three altogether?

A. Yes, to the best of my recollection.

Q. (*By Mr. Justice Cresswell.*) That putting the brass on?

A. Yes.

Q. (*By Mr. Martin.*) How many instances of the other have you known?

A. I cannot exactly say to my recollection.

Q. About how many—scores?

(*No answer.*)

Q. A score?

A. Why, I should think a score.

Q. Do you know who was the man who tinned them: was it the last witness?

A. Yes.

Q. (*By Mr. Justice Cresswell.*) Maso n?

A. Yes.

Re-examined by Mr. S. Wortley.

Q. They were generally with the tin surface to the journal?

A. Yes, generally.

Q. How came you not to do more with the brass uppermost. You say, sometimes you put the brass over the tin?

A. Sometimes it took such a thick solder to fill it up, that we thought we would put a piece of brass in: we generally had some old brass by us.

Q. Why did you not do that oftener; did you find it answer?

A. Yes, it answered our purpose.

Q. You only did that three times?

A. No, I do not know—but about three.

Q. Did you find those with tin lining worked easier than brass?

A. I do not know that it did, exactly.

Q. Your attention was not called to that exactly?

A. No.

JOSEPH CLARK SWORN.

Examined by Mr. Cowling.

Q. Are you in the employment of the Manchester and Leeds Railway Company?

A. I am.

Q. In what department are you?

A. Examining the engines.

Q. How long have you been acquainted with machinery?

A. I served my time to it.

Q. (*By Mr. Justice Cresswell.*) How long ago?

A. Well, I went apprentice in about 1822; I believe it was.

Q. (*By Mr. Cowling.*) How long have you known steps lined with tin?

A. In 1824 I fitted up a small lathe for my own purpose. I bought a lathe head of another person. The brasses being too wide, I took them out and took them to a tinner's. I got them lined up with tin about three-eighths, to the best of my recollection, so that they would fit for the purpose of my spindle.

Q. Did you use the lathe afterwards?

A. Yes; many years.

Q. How did it answer?

A. Very well.

Q. Did you observe whether there was any heat or not?

A. It never did heat any; it was only a foot-lathe.

Q. Then there would not be much heat either way? Did it revolve fast?

A. No; I used to humour the speed according to what I was turning.

Q. Have you known steps made entirely of block-tin?

A. Yes; I cast a pair myself.

Q. How long ago was that?

A. It was in the early part of 1841.

Mr. Justice Cresswell.—There is no dispute about block-tin steps having been made and publicly used before this patent.

Mr. Cowling.—No, my lord; I will not ask him further upon it.

Cross-examined by Mr. Baines.

Q. What are you—in the employment of the Manchester and Leeds Railway?

A. Yes; I am the inspector of engines, or examiner, or whatever you please to call it.

Q. What do you call it?

A. I call it inspector.

Q. How long have you been so?

A. About two years.

Q. What were you in 1824, when you fitted up this lathe?

A. I was apprentice to a mechanic, at Bradford.

Q. Who was he?

A. Messrs. Hattersley.

Q. How old were you at that time, when you fitted that up?

A. I would be about sixteen years of age, as near as I could tell.

Q. Then did any body point out to you the way of doing it?

A. No; I did it for economical expenses. I had not much money to spare.

Q. And what did you then use it for?

A. A foot lathe.

Q. What, in your master's business?

A. No, in my own business; for instructing myself at home.

Q. Not a thing you used at all in your master's business, or at the shop?

A. No, it was not; it was at home.

Q. Did they ever see it, the folks at the shop?

A. No; my master never saw it.

Q. How long did you keep it and use it?

A. Why, it is a very little bit since I parted with it.

Q. Where is it now?

A. It is in Leeds now.

Q. When did you part with it?

A. When?

Q. Yes.

A. It would be, let me see, about the early part of 1841.

Q. You call that lately; you parted with it in 1841?

A. Yes.

Q. Who has got it now: how came you to part with it—this old acquaintance of yours?

A. What made me part with it? I had wheels for snuff-box turning and different purposes for it, I had not time to follow it up; business kept me rather tight; I sold it to a person who required it, and who wished me to sell it to him.

Q. Who is he; what is his name?

A. He is a wood-turner; his name is ——— I will tell you his name directly.

Q. Perhaps it would be rather hard to ask it of you, as it was in 1841. Are you in the locomotive department?

A. I am.

Q. In Manchester?

A. Yes.

Q. I believe the Leeds and Manchester Railway are now using Babbitt's patent?

A. No, not that I am aware of; they are not.

Re-examined by Mr. Wortley.

Q. I believe they are using an invention of Mr. Fenton's?

A. Yes, that has the chief run; the white metal—the anti-friction metal of Mr. Fenton.

Q. You say your master did not see this lathe; did any of your comrades see it?

A. Oh, yes.

MR. PAUL HODGES SWORN.

Examined by Mr. S. Wortley.

Q. I believe you are a civil engineer?

A. Yes.

Q. Are you now residing and carrying on business at Manchester?

A. Not carrying on business.

Q. Residing at Manchester?

A. Residing at Manchester.

Q. How long have you resided at Manchester?

A. Seven months, on and off. I have been recently in Cornwall on a visit to my friends.

Q. Were you brought up as an engineer?

A. Brought up as an engineer.

Q. Have you since been in the United States?

A. I have been in the United States fourteen years.

Q. What part of the United States did you reside in?

A. New York.

Q. What position did you fill there?

A. Civil engineer; my offices at No. 2, Wall Street.

Q. Were you also acting as an agent for patents there?

A. Yes; I was the legalised agent for the southern district of New York.

Q. Now, were you formerly, before you went to America, in London?

A. I was.

Q. About the year 1827?

A. No, 1829.

Q. Do you remember about that time making some experimental bearings for a fir-cutting machine?

A. Yes.

Q. Just describe how that was made. Can you describe it?

A. I made a sketch on that piece of paper.—(Pointing to it.)

Q. Can you describe it without that?

A. Yes; the brass was cast with longitudinal grooves—dove-tail grooves, and the block-tin was run into it.

Q. Point your attention to that one.

A. It was done in this way.—(Pointing to the plan.)

Q. (*By Mr. Justice Cresswell.*) Patches of block-tin run in?

A. They were not patches; they were strips. This was a new brass: it is a section.

Q. (*By Mr. S. Wortley.*) What was the object of introducing that tin?

A. I had seen it in practice before in machines. I remember to have seen it since: not only tin in connection with brass, but also cast iron: cast iron wears better than tin in this way.

Q. For what purpose was it introduced in this way?

A. For a fir-cutting and a blowing machine.

Q. For what purpose was it introduced?

Q. (*By Mr. Justice Cresswell.*) Why was the tin introduced?

A. There is much less friction than there is with brass alone.

Q. That was the object?

A. It was; there was tin and lead together.

Q. Tin alloy?

A. Tin alloy.

Q. Was that an alloy of which block-tin was the basis?

A. Yes.

Q. (*By Mr. S. Wortley.*) Now, subsequently, were you engaged in Cornwall?

A. I was.

Q. Where?

A. In St. Austel and its neighbourhood.

Q. What were you doing there?

A. Connected with mining machinery principally.

Q. Did you make a lathe for turning iron?

A. I did.

Q. (*By Mr. Justice Cresswell.*) When was that?

A. In 1829 I made the lathe.

Q. (*By Mr. Wortley.*) How long did you continue to use that lathe?

A. About two years; very nearly two years before I sold it.

Q. In what way did you use it?

A. I used it in the turning of iron; in making experimental machinery.

Q. Where did you sell it?

A. I sold it in London; in Castle Street, Long Acre.

Q. Does that plan accurately describe the lathe you at that time made?—(Handing a plan to the witness.)

A. It does.

Q. Does this represent the journal of the lathe?

A. Yes?

Q. This point meets the journal on the other side, so as to hold the thing to be turned?

A. That is what is commonly called the nose of the mandril: it is to hold the thing to be turned.

Q. Does this represent a section of the step on which the journal ran?

A. It does.

Q. Does this yellow represent the section of the outer brass frame of the step?

A. Yes.

Q. Does this inner blue line represent a section of a pewter lining?

A. Block-tin and lead?

Q. Block-tin and lead lining.

A. Yes.

Q. And do these small yellow points here represent a sort of rims or fillets that confined it?

A. Yes, it does.

Q. Now, in what way was the block-tin and lead lining introduced into that step?

A. It was poured in through the hole on the top of the lathe.

Q. Does this hole represent the hole you speak of?

A. Through the cap.

Q. What was placed in the centre of the step for the purpose of making the lining at the time the lining was poured in?

A. At the centre of the step the mandril was placed in.

Q. So making it a mould, in point of fact?

A. Yes.

Q. Has your attention been called to the mode in which these steps are made with the journals to run in them?

A. It has.

Q. First, I will ask you with what object was this introduced?

A. There were two objects. I knew very well that it would wear better than the brass; the other object was to save a great deal of trouble and expense in making the lathe.

Q. Was it a lathe for turning iron?

A. A lathe for turning iron.

Q. (*By Mr. Justice Cresswell.*) What was the second object?

A. To save the trouble and expense of making the lathe. I would have had to make a boring-bar to bore these bearings out, when the other way would do equally well, and it was done in a few minutes: it was made at half the expense; a boring-bar would have cost me half a-day to make it, and half a-day to work it out, in those days I presume.

Q. (*By Mr. S. Wortley.*) This was introduced when it was new at first?

A. When it was new.

Q. Did you find that it heated at all?

A. Not at all.

Q. I take it for granted, as it was to turn iron, it was to turn by machinery?

A. Yes.

Q. You say you used it for two years before you sold it?

A. Yes.

Q. Did you use it in secret or openly?

A. Openly. I had several individuals calling at my place. Mr. M'Cabe called at my place, who was a farrier, or was then a farrier in High-street, St. Giles's. We had a contract for him at one time to take the machine, but I could not finally make the arrangement with him which I intended. I sold the machine afterwards.

Q. Now, before that, had you known block-tin, or alloys of which block-tin was the basis, introduced into this step or bearing?

A. A very common practice with us in Cornwall.

Q. (*By Mr. Justice Cresswell.*) For what purpose?

A. For making machinery.

Q. For making it?

A. Yes, the lathes that were used for making machinery.

Q. I do not understand you.

A. I alluded to block-tin being commonly used in making lathes.

Q. You say it was a common practice, then, in Cornwall to introduce block-tin into the steps or bearings for lathes?

A. For lathes.

Q. (*By Mr. S. Wortley.*) Into the steps or bearings of lathes used in the manufactory of machinery?

A. Yes.

Q. Had you seen such before you made that one?

A. I saw a lathe once in Penzance, in Cornwall, belonging to a very clever man, an ornamental lathe, made in France, that was supposed to be 150 years old; that was the oldest lathe I ever saw made of block-tin.

Q. I want to know whether you had ever seen any other?

A. All the lathes in the establishments in Cornwall at that time, of that kind, were very common.

Q. Since that time, have you seen steps in use with linings of that description?

A. I should say hundreds.

Q. Where?

A. In the United States, and in England as well.

Mr. Justice Cresswell.—We have nothing to do with the United States; we do not take the evidence of the United States.

The Witness.—I did not know that.

Q. (*By Mr. S. Wortley.*) Have you attended to the evidence in this case?

A. I have.

Q. Did you hear the description of the steps used by Mr. Newton, the plaintiff?

A. I did.

Q. In your opinion, is there any difference in principle between that step and the one you introduced into your lathe?

A. There is a slight difference.

Q. What is it?

A. If you will give me the step, I will show it you.—(It was handed to the witness.)—The only difference that I see is, that in this there is a reveal or recess coming down over the flange, in addition to the fillet; that is the only difference.

Cross-examined by Mr. Baines.

Q. Where do you live now?

A. In Manchester.

Q. You have not got one of the lathes themselves here?

A. No, I do not carry lathes with me.

Q. As I understand, then, the surface here is smooth and even; the brass here, the tin here, then brass again, then tin again, and so on all round?

A. Just so.

Q. What did you say about cast-iron?

A. I have used the strips of cast-iron as well as tin.

Q. What you did was to fill up these spaces with tin?

A. Yes.

Q. Leaving this brass?

A. Leaving the spaces intervening with brass.

Q. And you thought the effect of the whole was, there was less friction and less heat?

A. I knew the effect was that.

Mr. S. Wortley.—You are now speaking of the first with alternate rims?

Mr. Baines.—Yes.—(To the witness.) How long did you continue to use that?

A. I used this brass in an experimental machine for the cutting of fir and blowing.

Q. How long did you use them?

A. I used them for some months, the machine then passed out of my hands.

Q. (*By Mr. Justice Cresswell.*) Where did you use that machine?

A. In London.

Q. (*By Mr. Baines.*) When was it you made the steps you speak of?

A. The steps of the lathe?

Q. No, when you were down in Cornwall?

A. That is the step for the lathe described in that drawing in 1829.

Q. Is this a different thing from this—(pointing to the plan)?

A. Quite so.

Q. What is this? just explain that.

A. These are two boxes.

Mr. Justice Cresswell.—That is the one he did explain that he made by pouring in the metal in a state of fusion through a hole at the top.

The Witness.—It was precisely the same as that brass step I had in my hand, with the exception of the recess in the flange; there was a fillet and not the recess.

Mr. S. Wortley.—There was a question I wanted to ask this gentleman, I will ask it when you have done.

Q. (*By Mr. Baines.*) How long did you use that in Cornwall?

A. I used it some months in Cornwall, and then brought it to London with me.

Q. Have you ever had anything to do with locomotive engines?

A. I have a great deal.

Q. (*By Mr. Justice Cresswell.*) Stop, stop; you used it for some months in Cornwall, did you?

A. Yes.

Q. Did you use it in London afterwards?

A. I did.

Q. (*By Mr. Baines.*) You have had a great deal to do with locomotive engines?

A. I have had a great deal to do for the last fourteen years.

Q. When did you come over from America?

A. I arrived here on the 22nd November last.

Q. How long had you been there?

A. About fourteen years.

Q. And you made this thing in America also, I understand you to say?

A. I did not make them myself, but I have directed soft bearings to be made myself in America.

Q. What part of America were you in, where did you reside when you were there?

A. New York.

Q. Did you know another gentleman of the name of Hodge that came from America—is there any person of that name who you know?

A. No.

Q. Are you sure of that?

A. I am certain of that.

Q. Did you not know a Mr. Hodge who came over here in the Autumn of 1843?

A. Not to my knowledge at present. I do not know

Q. You were not over here yourself at that time?

A. In 1843?

Q. Yes.

A. I was.

Q. What time did you come over?

A. In August 1843. I arrived here in August.

Q. Did you see Mr. Fenton, the superintendent of the locomotive department of the Manchester and Leeds Railway Company?

A. Not to my knowledge.

Q. Did you ever propose to anybody to take out a patent for this?

A. No.

Q. Had you communicated the information to anybody?

A. Not at all.

Q. Did you see a person of the name of Donaldson in August or September 1843 ?

A Not at all.

Q. Or have any communication with him ?

A. Not at all. I know no such person.

Q. Did you ever state to either of them who was the inventor of this invention of Mr. Babbitt ?

A. Either of whom ?

Q. Either Mr. Fenton or Mr. Donaldson.

A. I tell you distinctly, I know nothing of those gentlemen.

Q. Have you stated it to any other person, or any body at that time ?

A. Not at all.

Q. Or had any conversation, in the August of that year, about them ?

A. Not at all.

Q. Were you aware Mr. Babbitt came over in July of that year, 1843 ?

A. Not until recently, until within the last two or three days : I believe this gentleman, Mr. Newton's agent, told me of it yesterday.

Q. Do you know Mr. Babbitt ?

A. I do.

Q. Of Boston ?

A. I do.

Q. Were you aware he was coming to this country in the summer of 1843 ?

A. Not until yesterday, when I was informed by this young gentleman here.

Q. You were not aware of his intention to come ?

A. Not at all.

Q. However, you came over in August ?

A. Yes.

Re-examined by Mr. S. Wortley.

Q. You went back ?

A. Yes.

Q. How long were you in England?

A. I was absent from New York six months and two days, I believe. I cannot distinctly say how long I was in England.

Q. Had you any communication at that time on this subject, either with the Leeds and Manchester Railway Company, or the Grand Junction Railway Company?

A. With no one.

Q. I believe your first communication with the Grand Junction Railway Company was within a very short time, was it not?

A. Within a few days.

Q. About the first of these machines—you say you took it to London, and used it in London?

A. Yes.

Q. Had other persons an opportunity of seeing it used there?

A. Plenty.

Q. And this one, which you took to London, did you use it secretly or openly in your house?

A. I used it openly in my house; I had an establishment connected with my house: at that time I was principally engaged in making experimental machinery.

Q. I do not understand you to say that this was an experiment, but you were engaged in making experiments in machinery?

A. Making experimental machinery. It is a common lathe.

Mr. S. Wortley.—That is the Defendant's case, my lord.

Mr. Baines.—May it please your lordship. Gentlemen of the jury—I must now trouble you with a few observations in reply in this case. I do not mean to speak disrespectfully of any of the gentlemen individually who comprise the Grand Junction Railway Company, but as a Company, and as Defendants on this occasion, I really must take the liberty of saying that I have never, during the whole course of my experience in courts of justice, witnessed conduct more oppressive—more disingenuous, in every respect, towards a poor patentee, than that which this great Corporation have been advised to adopt on the present occasion. I undertake to show you before I sit down, that they have in every way acted discreditably as a Corporation, as Defendants here, towards the poor man who is now struggling for your verdict. I undertake to satisfy you of that fact. I will show it from the correspondence before I sit down. And there is one circumstance which presses on my mind at this moment, with which I will trouble you at this moment, because it so suggests itself to me; and it is this—that they, these Defendants, who, as I will undertake to show you, have been pirating the invention of Mr. Newton, the Plaintiff, have only it seems within the last week or fortnight, or three weeks—for some of the witnesses speak of one period and some of another—been scraping up the evidence which they lay before you to day, in order to defeat my client on the ground of want of novelty in his invention. It seems this Mr. Hodge, the gentleman who has been last in the box, had not spoken of it until within the last week. You will remember several of the other witnesses who I called had not spoken of it until within the last week: they, therefore, could not have been acting upon any information derived from them at the time when they did that which I complain of in this cause, at the time when I say they pirated the invention of my clients. That is a circumstance you will have the goodness to bear in mind when you are considering the evidence, and see (which you will have to do by and by) how far the balance of testimony on the evidence on the part of the Grand Junction Railway Company is or is not equal, in point of fact, to that I had the honour of laying before you yesterday.

Gentlemen, I have stated, and state it again, in the most fearless manner, that I have never known anything more oppressive than the conduct of the Grand Junction Railway Company towards this patentee. And I will state to you why I say so. They have put upon this record every kind of defence—they have denied every allegation that Mr. Newton was obliged to make in order to support this action. He was obliged to state he had sufficiently described his invention in the specification.— No, says the Grand Junction Railway Company, by their record, you have not. The first thing Mr. Wortley says when he gets up today is, "Oh, though they have said you have not, you really have. —We have no fault to find with it when we come into court—we have put this upon the record in order to harass you—in order to deter you, a poor man comparatively." (Certainly, comparatively, a poor man, struggling with the joint stock powers of a great Corporation of this kind.) "We have put this and other defences upon the record, in order that you may be deterred from coming into a court of justice to assert your just rights." Is that all they have done? No. They go on to say, you did not file your specification within six months. My learned friend gets up in a moment, and says, I must acknowledge what we have said is utterly untrue; that you did file it within six months. I ask why did they say that? But, far worse than that, they have put upon the record this defence, and I beg you to remember this throughout, how they have dealt with my client. I then ask you to judge how far they are acting honestly or disingenuously with regard to him, or rather by him? They say upon this record, "In this invention of Mr. Babbitt's there was no public utility whatsoever" —they say that in the most distinct terms upon the record on which this trial takes place. What was my client to do? My learned friend said, "Why, his Counsel yesterday called witness after witness in order to disprove what I cannot deny before the Jury, though I did deny it to the Plaintiff when he brought his action, that this is an invention of great public utility"—says my learned friend, that was undeniable from the first. Why did they harass my client with a plea of this kind put upon the record? He was bound, when he was met with a plea of that kind, to seek evidence, and to seek evidence from all parts of the kingdom. He did not know what might have been raked up against him. He might have anticipated the very worst on that point, after some of the evidence brought forward by them upon other points, to which I will call your attention by and by. They put him upon his defence on that point—they told him distinctly, "Sir, your invention is of no public utility whatsoever."—They laid upon him the vast trouble and expense of bringing to Liverpool all those eminent witnesses who were before you yesterday—they laid him under the necessity of doing that. When they see these gentlemen in a court of justice, and the case is so plain on the ground of public utility, that even I was going to say the appointing of these subordinate agents of the Grand Junction Railway Company—to whom I have no doubt this defence is owing—is no longer capable of struggling with this as a question of public utility, they say, "Why do you trouble us with this evidence?" Why for this reason—they called upon us to bring it in the first instance. They challenge us to the proof of the public utility of this invention. They say as hardily as they have said before you to day upon the subject of novelty—this invention has no public utility in it. They put my client to all the trouble and expense of bringing before you all the witnesses whom he was obliged to bring yesterday—Mr. Stephenson and all the eminent machine-makers from the different parts of the country. Is that the way in which a great Company, like the Grand Junction Railway Company, ought to conduct a case of this kind, even if they should ever have allowed this case to come into a court of justice at all? I will undertake to satisfy you from the correspondence, they have acted in the most unfair and disingenuous manner in other respects. But I say it is downright cruelty and oppression to a man in the situation of my client to be met with a defence of this kind from the Grand Junction Railway Company, they putting him to the proof of that which they know well can be proved; and putting him to prove it for this reason, in the hope he would be deterred, when he saw a defence of that kind upon the record, either by the apprehension of what they might do in the way of getting up evidence, or by the reasonable apprehension of the vast expense of an action like this, from coming forward to assert his just rights in a court of justice, and exposing the piracy of which I undertake to satisfy you they have been guilty. Am I wrong in applying this epithet to the Grand Junction Railway Company? I shall appeal to you, gentlemen, and by your decision on that subject I am quite content to abide.

Now my learned friend has discussed this question as to the conduct of his clients, for he thought it required some kind of apology when he arose to address you. You will remember what kind of apology even his ingenuity was able to make for them.

That topic being dismissed, I come now to consider the matters in issue between my learned friend and myself, those matters on which your judgment will have to be taken by my lord by and by.

And, first, I am anxious to grapple with this question of the novelty of the invention, which my learned friend disputes. Before I state to you what the evidence is on the one side, and on the other side, with respect to that, because your verdict will have to be formed on the balance of the testimony—give me leave to say exactly what it is that is claimed by the present Plaintiff.

Gentlemen, what he claims is this—he claims as his invention—"That whereas machinery of this description was formerly made with the uncovered brass or hard metal, so that the journal or gudgeon running in it produced a heat and an abrasion which was found to be exceedingly mischievous and expensive," he has obviated that by a very simple contrivance, and the simplicity certainly ought not to be an argument against it—it is rather an argument for it; for of almost all the important inventions, those which have turned out to be the most important inventions, known in the history of invention, are certainly of the simplest character; the wonder is when you have them how they could have been so long undiscovered. I am sure you will agree with me that is really the result of almost all the inventions that have been promulgated.

What was done by Mr. Babbitt is this: finding this evil existed, the evil of heating and abrasion, what he did was to cover this in the first place with a coat of tin—it was to be tinned in the way described in his specification—the brass or bell-metal was to be tinned in the way described by his specification; then when it had been prepared in that way for the chemical combination of that which was put upon the tin, there was introduced a combination or an alloy of some kind or other, of which block-tin was the basis; then the whole put together and combined chemically, and you have the advantage then of the softer material inside, which had the effect of diminishing the heat and abrasion, coupled with the advantage of the harder material outside, upon which you recollect Mr. Fernihough spoke so distinctly in his evidence yesterday, but which my client has never claimed as an essential part of that invention—the use of these rims. It is said that these rims must be made use of in order to make the other of use. He has recommended the rims no doubt,—the fillets, as the best and most effectual way of carrying into effect his object. And so it is, no doubt—the witnesses called before you yesterday, say that is the advantage of these rims; but these rims are not essential, nor were they ever treated by my client as essential, in his specification. He says, "the object for which I use these rims is to prevent its spreading—keeping it in its place." Then he says, "there are various other modes by which it may be done, knobs projecting, and holes," but he says, "I do not claim as any part of the invention I have propounded to the public, these rims as necessary to keep it in its place, but it is better if you use them." And there is no doubt if these gentlemen durst have pirated these rims they would have pirated them. It is much better to use them, but it is no essential part of it. The essential part is the alloy put upon the tin in that way, the bottom of the whole being a hard metal. So that you have the combined effects of the softer metal inside, and the harder metal outside. That is what is done by Mr. Babbitt.

My learned friend, Mr. Wortley, says there was a witness of yours yesterday, Mr. Fearnihough, who said the filleting was an essential part—in fact, it was the essential part. Mr. Fearnihough never saw these, probably, without the filleting. I think you will be of opinion, when you see the other evidence in this case, that supposing Mr. Fearnihough thinks it is essential, he evidently thinks it is of great use. Mr. Stephenson and Mr. Cubitt think it is of great use, but they do not treat it as essential to the use of the softer metal here. What Mr. Fearnihough said upon the subject, was as to the duration. But Mr. Fothergill, the first witness whom I called, stated it as a merit in the invention that it contracts the tendency to spread, that is, the fillet or rim. Mr. Stephenson uses the same words. And Mr. Cubitt says, that without the ledges it will not do so long as the others, but they answer the same object; it wears out sooner—it spreads so as to wear off sooner if you have not ledges, but you have, to a certain extent, the same benefit by having it in the way they have done it. The way they have done it, is this which is here before you; you will judge whether this is or not a piracy of the invention of Mr. Babbitt. The way they have done it is this; they have tinned it in the first instance, then they have plastered on—in a very clumsy way, no doubt, still it is obvious—the block-tin in the way I have shown to you; the surface is comparatively uneven, it wears off sooner than the other. As long as they have it, they have the full benefit of the invention; it only requires being replaced more frequently, which I dare say they think they can afford to do, if they only escape paying the patentee for his license, or coming to any reasonable terms upon the subject. That that is the important part of the invention here, and that which I complain of as being infringed by the Defendants, I apprehend to be abundantly clear. There can be no confusion in your mind with respect to the subject of the fillets, as to which Mr. Wortley attempted to treat it as the essential part of the whole, without which the rest was of no value. No value! Why, their own experience for the last two years, since they have begun using it, has shown it is of value. They have been using this tin thing all along. That is in proof, by the evidence I shall refer you to, therefore, they have had the benefit of it. Why, the foreman, Mr. Allen, who is now in court, whom they durst not call to-day, though distinctly challenged to do so by a witness of mine, who is proved to have gone about bragging to the Directors—" See, gentlemen, how I am saving your money, in having lessened the quantity of oil necessary for your works, and made your works more durable than they were before." That was proved yesterday; that was distinctly proved by the witness, who swore that Allen had done this, that he had led about the Directors, to show how much benefit they were deriving from this. At that very time, I am sorry to say that, in their correspondence, a gentleman is instructed, on behalf of the Company, to say, it was very doubtful to say whether they were deriving any benefit at all from this tinning, and that they had serious thoughts of laying it aside; at the very moment that gentleman was instructed to write those letters, it appeared that this very Mr. Allen, who they durst not put into the box, though he is here, their own foreman, was pointing out to the Directors this as an invention of great utility, which had already saved them much oil, and was already productive of great benefit with respect to the increased durability of the works. You will remember that, because these little circumstances are of great importance in a case like this.

Now with respect to the evidence that has been given about the novelty. Having stated to you what the invention is which is claimed by my client, I beg leave to call your attention to the evidence which has been given upon that subject. First I take leave to say, that patching and botching, which is what has been spoken to by a great many of the witnesses, is not the kind of thing that I complain of, because ever since tinkers existed in this world, there has been something of the kind going on, there has been soldering put on, there is no doubt about that. The question here is with respect to the manner in which this has been applied for the purpose mentioned by Mr. Babbitt in his patent which is taken out, and I think you will find, when you come to look at all the evidence in this case, especially when you come to compare that which has been given by the Defendants with that which has been given on my side, that this was substantially a new invention on the part of Mr. Babbitt at the time it was introduced, and is proved by all the evidence in this case to be an invention of first-rate public utility. Gentlemen, again I say, that using block-tin steps will scarcely avail my learned friend as a defence in the present case. There was some evidence given yesterday by a witness who I called, about block-tin, and it was proved by one of them, that, some years ago, block-tin steps had been put on an engine that was to be used upon the Dublin and Kingstown Railway. It was proved by a witness that came afterwards, that had failed, in consequence of not being able to bear a proper weight; at all events this was proved—though that was done ten years ago, there have been no orders for that kind since. It is not the introduction of block-tin, to prove that block-tin steps have been made, that will at all serve my learned friend on the present occasion. I have said what it is that will not serve my learned friend; I beg your attention to the kind of evidence he has given to-day. I will just mention shortly, before I state what is the evidence given on the part of the Plaintiff, the evidence he gave upon this subject. The first witness whom he called was that extraordinary witness, Thomas Radcliffe, who, you will remember, excited the risibility of you, gentlemen, as well as everybody else. When my learned friend was finding fault with Mr. Martin, and censuring him for laughing, he did not observe how universal the laugh was throughout the Court, at the expense of that first witness of his, Mr. Radcliffe. He is the person who stated this, because to go through that man's evidence in detail (if you are reminded of one or two things he said) would be ridiculous. It is clear that that man is of the description of those of whom, if you take the trouble and lay out money, you may get a hundred in any case—I am sorry to say, in no class of cases so frequent as in patent cases. They are always raked up in cases of this kind, in order to defeat the just claims of a patentee. Some men influenced by vanity and others by worse motives, are induced to come forward and pretend they have been the inventor of a particular subject, and the discoverer of an invention; others come forward and say, "Oh, we have seen it in use with others;" yet when you come to inquire into the thing and sift it, it always turns out, in the case of a well-founded claim that is submitted by the Plaintiff such as this is, such evidence is not trustworthy at all, as I trust you will find it in the present case; this was a man who said this was perfectly well known. I thought I would see how far this man would go, because after the evidence we had heard yesterday of Mr. Fothergill and Mr. Fairbairn, and the heads of the first machine-houses in this country, who have made it their business, not only to construct machines, but to make themselves acquainted with every improvement that comes out for the practical purpose of introducing them into their machine-making—after the evidence given by these gentlemen, I was desirous of seeing how far this gentleman would go in his assertions on this point. He says this was perfectly well known. I have not the least doubt about that. He says I never missed a week in doing this thing; I have been at them from four in the morning until half-past eight in the evening, tinning and lining steps of this description.

Mr. Justice Cresswell.—Do him justice, Mr. Baines, that was only limited to the last six or eight months of this year. Whether that was in consequence of the patent or not, is another matter.

Mr. Baines.—Just so, my lord, it was so recently. Whether they have been extending their labours in that concern of his, where this gentleman has been employed in consequence of the patent being taken out, or with a view of doing that which the Grand Junction Railway Company have been doing, or enabling others to do, you will have to judge by and by.

Then came Mr. Heskith, who was an engineer; and he spoke to what he had seen, or said he had seen. What he stated on the subject was this,—they were all old steps I saw lined; he says, I told those persons, the Grand Junction Railway Company, a fortnight ago, what I had seen at Messrs. Hassels, and never mentioned it until a fortnight ago. That is one of the persons who has been raked up within the last fortnight, and who never has mentioned it until within a fortnight; yet if it had been done before, and produced the beneficial effects he says resulted from it, you would judge whether he would not have mentioned it long and long ago.

Then came Mr. Parkinson, whose evidence is very illustrative of the entire case for the defence altogether. He, it appears, is the brother of the Parkinson who is employed by the present Defendants, who is in their service now, and who is precisely in that department, which, if they thought fit to give you information on the subject, they would call him as the very first witness, in order to prove what they have been doing, or rather not been doing, during the last two or three years they have been infringing our patent. I asked him, "Is not your brother in the service of the Grand Junction Railway Company—is he not at this moment in court?" He is obliged to say he is here, and they do not venture to produce him, any more than Mr. Allen, the foreman whose name occurs in the correspondence, any more than Marshall, the other man whose name occurs in the correspondence. What can be the reason of this? What! not dare to produce before you their own servants, the persons more under their influence than any other persons! They do not care to produce them before you because they know well inquiries will be put to their servants as to when they first introduced this invention, and in what way they have carried them on. I should have been enabled, I have not the least doubt—I will leave you to infer that from their conduct in the management of this defence—I should have been enabled to show you other instances, too, in which that correspondence on the part of the Grand Junction Railway Company is, I am sorry to say, deficient even in bare truth. I am not here imputing anything to the gentleman whose name appears to most of the letters written—I suppose he acted according to his instructions, I have no doubt he did so; but that these letters or many of them are utterly inconsistent with the truth—utterly inconsistent with the positive and ascertained facts, I undertake to satisfy you before I sit down. Mr. Parkinson says, they lined these up to suit a particular size, they used it to fill it up. That is the description he gives of them. He says that my father did them in the first instance. It was done at Grime's—I did it myself at Grime's establishment at Bury. He says I have seen them at Kay's, engine manufacturers, and a son of his. It then occurred to me to ask him this, Well, these people, your masters—the masters of these places where you say this was going on, must surely have known of it—of course they were acquainted with all the processes going on at their works—is any one of these masters here? Is there any one of the description of Mr. Fairbairn, who I called, or Mr. Fothergill? Is there any one of these here to tell the jury a single word upon this subject? Not one. And this man says, though there were persons there, and though these masters must have known what was going on, the Grand Junction Railway Company, who have no doubt applied to these masters, and found what the truth of the matter is, have not been able to produce a single one of those persons before you, in order to confirm one word said by Parkinson and the others.

Thomas Barlow was the next witness. He described quite a different way of doing it from that which was described by Parkinson. But the same observation applies with respect to him as to those others, that he was working, as he says, at certain manufactories where his master must have known of this, if it had been done in the manner he described. Not one of these masters, although you may depend upon it that application was made to them all, is brought before you, in order to say, "We, who are machine-makers and cotton-spinners, have known of this before; it is not new, as Mr. Babbitt alleges, because we have known it before." Do you think, if these persons really had discovered what they have pretended they have discovered, they would have made any secret of it, or claimed credit for it from these masters whom they were serving? Depend upon it, it would have been so. Yet, it is not until a very short period of time these witnesses say they have mentioned it to any one, except Mr. Parkinson, who says what is useful enough upon the subject. He says, "I told my brother, Matthew Parkinson, of my using this thing six or seven years since." According to him, he communicated to his brother, Matthew Parkinson, in the employment of the Grand Junction Railway Company, six or seven years since, he was doing this, and what was the benefit arising from doing it. Yet it is a very remarkable thing that the Grand Junction Railway Company never used this until three months after my client has landed in England, in 1843; and after their foreman, Mr. Marshall, whom I challenged them to call yesterday, whom they have not ventured to produce before you, who was shown to have been in and out of the sheds of the Liverpool and Manchester Railway Company, where Mr. Babbitt was adapting this improvement to the engines of the Liverpool and Manchester Railway Company. He had the opportunity of seeing what they were doing, and I impute it to him distinctly, that he had availed himself of what he saw on that occasion, in order to pirate the invention of my client. Though I did impute that to him distinctly, I say they have not ventured to call him. And then you are told by this witness Parkinson, that although they really did not introduce any part of this improvement until three months after Mr. Babbitt had landed in England, and after they saw him applying this thing in the sheds of the Liverpool and Manchester Railway Company, yet, nevertheless, Mr. Parkinson told his brother, their servant, some six or seven years ago, of the great discovery he had made, which would have been communicated, one would think, for the benefit of his employers, and not kept such a secret from the world, that all these eminent machine-makers, and others, had never heard a word about it until Mr. Babbitt's patent appears.

Then they call a person of the name of Wild, who tells you he was employed by Broadbent, a cotton-spinner, of Oldham. He says he was a mechanic, jobbing in repairing machinery. We sent the thing to the tinners—they were the old brass steps repaired with tin. What they say about this is very much what was said by Mr. Fothergill, in his examination yesterday. You remember he said it was not new at all in our manufactory to have that—workmen, when the machinery gave way, or when it wanted repairing, put in as a kind of make-shift some tin, or something of that kind—if he had had the new brass step at hand, he would very much have preferred that, but he used this as a make-shift; that, says Mr. Fothergill, I have known done at our manufactory. That is not the thing which we complain of, or anything like that, yet it is to that the great bulk of the evidence on the part of the Defendants go.

Then a person of the name of Clark, who is the next witness, says he made a lathe when he was sixteen years old for the sake of economising expenses; that he kept that for some years, down to 1841: he has unfortunately parted with it now, we cannot have the benefit of seeing it, but he tells us, he, at that time, had one upon this principle, and worked it down to 1841. He says he does not know who has got it now, but he had a thing which, according to his account, answers as well as this did. Then you have Mr. Hodge, the engineer, as he is called, and who it seems has been in the United States, the place from which Mr. Babbitt comes, about whom there is, certainly, this remarkable fact, that Mr. Hodge had been for a great number of years in the United States, and he had been in the way of hearing of what Mr. Babbitt had done. It is remarkable, Mr. Babbitt comes to this country, I think in July or August 1843, and Mr. Hodge, who had been absent for so many years, comes immediately after him. I put some questions to Mr. Hodge, as to a conversation which I supposed had taken place between him and others. He denies that any such conversation took place, therefore we must take his evidence as it stands. What he says is this: he says

"I made a lathe of this description." You observe here is brass —here is brass again, and then there are holes sunk into it; into those holes the block-tin is sunk, then the surface becomes even. It is not block-tin over this brass, but it is block-tin in a line continuous with the brass, and the same surface with it. He says the result of the whole was as good. I apprehend that is not the invention, or anything like it, which Mr. Babbitt has found out. That is the thing which you hear these gentlemen describe. He says he made these holes for the block-tin to go into, that the block-tin was let in in that way; and that being let in, one part of the surface which was exposed to the journal was then block-tin, the other part was brass, so as not to be the block-tin over the brass here, but block-tin forming part of the same surface which was exposed to the journal or gudgeon, or whatever it was, the rest of it being brass. That is what he says about that. He then goes on to state something about a lathe he had in Cornwall. He says, I saw a lathe made in Cornwall, and that that lathe he thinks is upon the same principle as that which was produced before you in court. He says that the lathe was publicly used—he tells you of its being used in London, and other places.

It is a question for you when you hear all the evidence in this case, the evidence which I have called, to which it will be my duty now to direct your attention, this being the last witness on behalf of the Defendants—coupled with the evidence on the part of the Plaintiff,—I say it will be your duty, when you hear the evidence on both sides, to consider whether the Defendants have made out what they undertook, or rather whether the Plaintiff has not completely made out that this invention, to the extent to which I have described it, was perfectly new at the time when his patent was taken out; that the invention was new, of having this brass step, upon which the wash tin was then put, and upon that the alloy afterwards, in order to make, upon the whole, that which is now shown to be so extremely useful a part of an engine, combining the advantage of the hardness outside, with the advantage of the softer and more pliable and less heating metal, inside.

Now let me call your attention shortly to the evidence which has been given on the part of the Plaintiff as to that. We thought it our duty to bring before you, challenged as we were by the plea on the part of the Defendants here, to bring before you persons from the very first houses in this country, machine-makers, engineers, and others, whose duty it was, as I have already submitted to you, not only to make the engines themselves on the most approved plan possible, but to inform themselves from time to time of all the improvements that were made, in order that they might introduce them into the engines of their customers. They are the men who are supplying all these great railway concerns with their engines, and other concerns—they come from the great places, Manchester, and other places; and I beg you to remember what the evidence is now with respect to that.

The first of them who was called, and who is a most important and intelligent witness, is Mr. Fothergill; and I beg you to observe in what manner he speaks upon the subject. He is the foreman of perhaps the first house in the country for works and machinery of this kind, the house of Sharpe, Roberts and Company. What Mr. Fothergill says is, he has been many years in their employment: he says, before this patent the box was universally made of brass and the gudgeon of iron, and that the great speed occasioned heat and abrasion. He says it was of first-rate importance that some other system should be introduced. So that at that time, when Mr. Babbitt's patent was taken out, it was universally acknowledged to be of first-rate importance that some system should be introduced, by means of which this heat and abrasion should be got rid of. This was many years after the locomotive had been introduced, yet up to that time Mr. Fothergill, who had been making engines of this description and machinery of all kinds, goes on to say, I first heard of this invention since 1843—it is a decided and valuable improvement;—it entirely destroys the tendency to heat and abrasion, which is a matter of very great consequence indeed. Then he repeats it in stronger terms. He says—We have made solid tin axle-boxes for the Dublin and Kingstown Railroad, to which I have already called your attention; but this particular invention has never been made use of before to my knowledge. And, I think you will be of opinion, if any such thing had been known, that the house of Sharpe, Roberts and Company undoubtedly would have been in possession of it, it being their business to make themselves acquainted with every improvement whatsoever. Yet this gentleman says, although he has been all these years in their employment as foreman of their concern, he had never heard or dreamt of an invention of this kind, until he found it was disclosed in the patent of Mr. Babbitt.

Gentlemen, Mr. Fairbairn is the next witness, and a most important witness he is. He is a machine-maker at Manchester, as you know. I dare say there is no gentleman here but does not know the high reputation of Mr. Fairbairn: there is no man in the country who carries on business more extensively or respectably. He says, my attention has recently been called to lining with tin; it was perfectly new to me. I have used block-tin and different alloys; but always in a solid state. Then he says, what was new to me consists in having this outer case of hard metal, and running in the alloy by way of joining the harder material; the whole forming by means of a chemical combination that which unites the advantage of the harder metal outside, and the softer in. I would just say with respect to that, that Mr. Fothergill gave a very important illustration and a very clear one of that. He says, it will not do to have block-tin, you must have hard metal outside, for this reason, it is necessary to keep it in its place: in order that it may be kept close and kept in its place, it is necessary there should be some hard and unyielding metal outside. The advantage of that is, this lining is introduced in that which is the hardest metal known outside, so that you have the combined advantage of the hard and soft metal in that way.

Mr. Robert Stephenson is the next witness. Who he is

I need not say to any one of you gentlemen. He is not only a person of the utmost possible eminence, as a railway engineer, but is well-known. He has been all his life concerned, from his childhood, with respect to the making of engines and machinery of one kind and another. He has had very great experience in locomotives. He speaks to this as an entirely new invention—he thought it his duty to recommend it to all the lines with which he is acquainted, that there should be introduced the patent of Mr. Babbitt—every one of the Companies with which he is connected has thought fit to try it. They have done in an honest way what, I am sorry to say, the Grand Junction Railway Company have done in an imperfect and surreptitious way—endeavoured to avail themselves of the best part of this invention, without paying a farthing for it.

Mr. Stephenson says what I have stated.

Then comes Mr. Wilkinson, the foreman of Bolton and Watts, of the Soho Works. Everybody knows what important works they are. He never heard of anything of the kind.

Mr. Thomas Jones, partner in the Viaduct Foundry, says, it was perfectly unknown to him in 1843.

Mr. Hicks, proprietor of some works at Bolton-le-Moor, says, I never heard of this invention until a year and a half ago. He says it is very useful. I am now making seven engines for the Dover line.

Mr. Bennett Woodcroft, who is a consulting engineer at Manchester, and also a practical engineer, says, that the tinning and putting on an alloy afterwards, in the way it is done here, is perfectly new to him. He speaks of it, also, at that time.

And then, gentlemen, there is the evidence, also, of Mr. Cubitt on the subject, who is an important witness, who speaks exactly in the same way.

Then came Mr. Sturrock, of the Great Western, and Mr. Fearnihough, of the Eastern Counties, and two gentlemen from the Birmingham and Gloucester Railways. We have called witnesses from all the leading Railways in the country, and all the leading machine-makers. Mr. Cubitt, besides being a railway engineer, was for many years in one of the most eminent machine-works of this country—Fenton and Murray's. Every one says, that until Mr. Babbitt's patent was taken out, in 1843, we never heard of the invention now in question.

Now, gentlemen, that being so, then with respect to this question of novelty, I must ask you on which side the balance of evidence is, and whether you are not perfectly satisfied, looking on the evidence on the one side and the other, that this was new at the time it was introduced by Mr. Babbitt, and that this first plea of the Grand Junction Railway Company, on which they lay most stress, has entirely failed them.

But my learned friend says, I will undertake to satisfy you, that the Grand Junction Railway Company have not infringed this patent. They say they have not infringed it. Have not they? We will see that directly. There are three witnesses who are no longer in the employment of the Grand Junction Railway Company, who are altogether independent now of interest, either way, about this matter. I have thought it my duty to call them before you: they are the three witnesses, of the names of Allison, Lewis, and Jones. You will find how very important their testimony is with respect to this matter, coupled always, be it remembered, with the absence of the other persons whom the Grand Junction Railway Company might have called before you, whom the Company have carefully withheld to-day, although they are now all in court within sound of my voice.

Allison says, he was out-door foreman to the Liverpool and Manchester Railway Company. This gives us the key to the whole matter. He shows us how it was the Grand Junction Railway Company came to know of this—what they have been doing about it; and shows, not only by what means they became acquainted with the invention, but how they have put it in practice since. He says, Mr. Babbitt came over in the August of 1843; he came to our works: a negotiation was begun with him about putting it upon some engines of ours: we did put on three of them, the Kingfisher, the Ostrich, and the Heron; and he goes on to tell us how well it has answered on their engines. He says, while this was going on at the works at Edge Hill, Mr. Marshall, the foreman of the Grand Junction Railway Company, was always in the neighbourhood: that he, this witness, had had a talk with him upon the subject. He says, they had a workshed close to where Mr. Babbitt was introducing this upon our engines, and soon after Mr. Marshall had had the opportunity of seeing Mr. Babbitt, he says, I saw Marshall getting into one of the railway carriages; he had some connecting brasses lined with tin: that was three weeks after Mr. Babbitt came. I had never seen anything of the kind before Mr. Babbitt came. This is a person close to their works, who must have seen this thing if it had been introduced. He says they had been lined thickly with tin; it was partly worn out. I have seen the principle on which the Grand Junction Railway Company do this work, and the principle is this: he says they wash it over with tin, and lay the tin as thickly as they can on the bottom of the brass that is used by them. I have seen several of the engines done with it. Marshall showed me the way he was doing it a year and a half ago. Is this true, or is it not? Where is Marshall? Marshall heard this. Do you believe if it was not true, and they could have contradicted it, they would not have called their own servant before you to do so? Does not the fact of keeping him out of the box speak volumes? He goes on to say the Kingfisher has run 20,000 miles since this improvement of Mr. Babbitt's was introduced —it is in as good condition as when it was first started. He says, the first thing I washed it over with tin, then took a stick and laid on the tin as thick as I could.

Then the next witness is Mr. Benjamin Lewis, and who is now foreman to a respectable machine-maker. It seems that at that time he was a workman in the employment of the Grand Junction Railway Company. Now let us see what he says about the proceedings of the Defendants. He says it was in October 1843, I saw steps laying out of an engine and laid on one side for the Directors to look at. Allen brought them to the spot—they did look at them: when Allen showed them, he mentioned to the Directors the saving of oil and the reduction of friction, pointing out to them the consequences that had followed from the use of these things, and the benefits they were deriving from them. He says it became quite general to use them with their engines before I left. Yet, one of the defences they put forward is, that they never have infringed this patent, and never done anything which can interfere with it. And this is the kind of thing, which, according to their description, they have done, having lined it in this way, washed it over with tin, then plastered it in the way you see it here,—without a rim—no doubt wearing off much sooner than it would if a fillet were introduced; but, as long as that lasted, giving them exactly the benefit which they would have had if they had thought fit to use Mr. Babbitt's invention in an honest and lawful way. There was a cross-examination about him, and let us see what that cross-examination came to. My learned friend asked him —"Do you say you ever saw a new step fitted in?"—he had clearly been instructed, no such thing had ever taken place—it was clear he had been so instructed,—let us judge of his instructions. Here is another sample of the way in which this case was conducted. He says, I saw a new step fitted into the Vandal. Says my learned friend—Who were there then? give me their names, who fitted them in. Where are those persons to contradict it? He says, I saw the steps come from the foundry neighbourhood—I am quite sure I saw new steps fitted into the Hyperion. Thomas Jones and John Thomas fitted them in. Is there any one of the four persons whom he names, when he is called upon to name them by Mr. Wortley, who they venture to call, in order to contradict the statement made by him? Gentlemen, do not you believe then what he says implicitly upon this subject; it was not a mere repair they were doing at that time, not mere botching and patching: he speaks distinctly to this fact, that he saw a step in the hands of one of those persons whose names he gives, actually brought from the brass-foundry neighbourhood. At the time it was new, the hole was not made in it. He saw it afterwards in a tinned state, and saw it afterwards put into this engine, the Vandal.

So much for the evidence on which these gentlemen have used this invention, and the way they have availed themselves of it.

Gentlemen, I will not detain you now, in as much as there is no matter in controversy between us. What is said in the evidence here about the utility of the patent. It is shown to be one of the most useful—I think I am bound to say this, after the course they have taken on the other side—one of the most useful inventions ever made known to the public, not only as lessening the delays incident to railway-travelling, from accidents of one kind or the other, but with less of those risks which it is of the utmost importance, the experience of every day shows, to reduce as much as possibly can be reduced.

Now before I conclude, I must say a word to you again about the correspondence which took place in the year 1844, because it does appear to me (I submit it to your better judgment) that those who appear here on behalf of the Railway Company, knowing as they must that such a correspondence as this was in existence, if they had had the least regard for the reputation of those for whom they are appearing here, would have advised them to do anything rather than bring this case before a jury.

There are only one or two of the letters with which I shall trouble you. There is the letter of the 18th December, which is this.—He says,—"I now beg to inform you that further enquiries have satisfied the Directors that by their operations at Crewe they have in no way infringed the patent you possess for the improvement in the construction of axle-boxes. They are moreover very doubtful of the utility of their present plan, and have some thought of reverting to the brass, as there does not appear to have been any saving effected in the oil." Is that true, or is it not, when you have it proved before you that their man Allen, their foreman, who they durst not call, was reporting to them the great saving that was effected in oil, the great saving that was effected in the durability of the engines. It shows to me, gentlemen, what is but too obvious throughout this correspondence, I am afraid that they were endeavouring, if they could, to get this gentleman's invention for nothing; if they could not do that, to beat him down to the lowest possible terms, by suggesting every possible difficulty in his way, threatening to attack him in every point, and not scrupling to have recourse to every misrepresentation, in fact saying what they do here, "that they are very doubtful of the utility of their present plan, and have some thought of reverting to the brass, as there does not appear to have been any saving effected in the oil." And the witnesses who I have called before you have shown, so far from their having reverted to the brass, they have been going on having these things tinned one after the other, until it appears at present all their engines are brought to the same state. He says afterwards—and you will find this is the mode adopted in the other letters,—"I am however desired to ask your terms for the full use of the patent claimed by you." It seems they had cribbed only one half or three parts—"I am however desired to ask your terms for the full use of the patent, claimed by you, when I will inform you of the final decision of the Directors.—Your early attention to this will be esteemed a favour." Now there is really a letter which it seems to me is anything but creditable to those in whose behalf it is written. Then there is a letter of the 5th October, to which I think your attention should also be drawn. The first letter is sent by the Plaintiff to them. You will observe what assertions he makes in that letter, and it is very remarkable that though he makes this complaint on the 5th October 1844, there is no direct answer to that letter until the 8th December afterwards. He states to them, "I have been long aware that your officers have endeavoured to avail themselves of the advantages of a patent granted to me on the 15th May 1843, for improvements in the construction of boxes for the axles or axletrees of locomotive engines and carriages, and for the bearings of machinery in general, and also improvements" in so and so, stating them. "I am aware however that some surfaces have lately been prepared on the plan recommended. Your mode of proceeding is a clear invasion of my patent." He goes on to say he is willing to enter into some kind of amicable compromise with them, and it is to be upon the footing of his right being admitted, and their consenting to pay what every other Railway Company was paying for the benefit they were deriving from that invention. To that letter, as I told you, there is no answer until the letter of the 18th December. Afterwards they write to say that letter shall be taken into consideration, and one thing and another.

Mr. S. Wortley.—The officers were absent.

Mr. Baines.—Yes, until they say this—"I now beg to inform you that further inquiries have satisfied the Directors, that by their operations at Crewe they have in no way infringed the patent you possess, for the improvement in the construction of axle boxes." You will judge whether they are or not. Then they go on to say about their being doubtful of the utility of the present plan and their recurring to brass. Then there is a letter of the 27th December which the Plaintiff writes, in which he says "that he is informed by his agent, Mr. Joseph Woods, that at his interview with you on Monday you express your approbation of the proposal I authorised him to make for settling our differences as to the employment of my patented invention, and that you require a written proposal to that effect." He says, "I now beg to call the attention of your directors to the experiments already concluded on the Liverpool and Manchester Rail." Then he gives them the highly favourable report given by Mr. Booth after twelve months' trial on the Liverpool and Manchester Railway of the invention. Then he goes on to say this, "In addition to this I am prepared to prove that your officers did not use the mode whereby you are infringing my patent previous to August 1843, that bearings constantly heating at that time were perfectly cured by the process, and ran some 4,000 to 6,000 miles without further adjustment, and that the consumption in your crank-axle passenger engines of oil has diminished since that time at least fifty per cent, and the goods' engine nearly in the same proportion. That your officers have attempted an imperfect imitation of my plan in a carriage, which failed, on the Birmingham Line, by reason of the soft metal filling up the grease-hole and stopping the supply of lubricating material, and causing the same to melt, and eventually to break the axle, whereby much damage has been done to my interests, in depreciating the value in the opinion of other purchasers." Taking these circumstances into consideration, he goes on to say, "I think a jury would award me ample damages from so wealthy a company as yours. I have however always wished to steer clear of legal quarrels, and excepting that a decision in this case would support and confirm my claim and position with the public, I have no desire to go into court. I will make you the following proposition." Then he makes them a proposition which my learned friend is instructed to pronounce as exorbitant. He says if he had not insisted upon this exorbitant proposition—upon those terms sadly too high—there would have been no difficulty in coming to an arrangement. My client thought himself entitled to ask from the Grand Junction Railway Company, just that which other Companies who were disposed to act more honestly, have been content to pay, it was the sum he proposed to them. That afterwards he made an alternative proposition about supplying them with their metal. They declined that; they declined every proposition; and at the very time they were telling him they were in possession of evidence to disprove his claim altogether, while they are at one time saying his invention is of no utility, and that they are thinking of laying it aside, and at the other time acknowledging that it is of great public utility, and that it is a useful thing—when they are writing in this manner.

Mr. S. Wortley.—You are not stating that right; that letter says, in the mode in which we proceed, we find them of no use.

Mr. Justice Cresswell.—Really, really, Mr. Wortley.

Mr. Baines—Before telling me I am guilty of the misrepresentation, you should be sure you are correct. I do not think I am wrong; I am not intentionally making any mis-statement.

Mr. Wortley.—Not intentionally.

Mr. Baines.—I say, gentlemen, taking this correspondence altogether, there never was a correspondence which exhibited the defendants in a light I will venture to say more discreditable than that on which these gentlemen are shown. I presume from the agency of some of the subordinates for whom they are responsible, whom I think they have such great reason to blame for the manner in which their conduct is now exhibited before you.

But, gentlemen, upon the whole—thanking you for the attention with which you have heard me—upon the whole, they have pirated an important part of the invention—that they have done it, it is true, in a clumsy way for the sake of disguising it, but that nevertheless they have done it; that that invention was a substantially new invention at the time it was discovered and propounded by Mr. Babbitt; that it is one of great public utility, I apprehend I have made out to you, I trust to your entire satisfaction. And, gentlemen, I do hope by your verdict you will teach this Grand Junction Railway Company and their agents, that although this man who is contending before you is, it is true, a foreigner, and though he comes very weak and poorly indeed, in comparison to those with whom he is struggling before you, he will have justice at your hand,—and more than justice he does not ask.

Mr. Justice Cresswell.—Gentlemen of the jury, the Plaintiff in this action complains against the Defendant for pirating his patent, that is, for the using the whole or some part of it; and if he has a good patent, and they have used any part of that which is his patent right, they are responsible for it. The Defendants have put upon the record a great many pleas, and it will perhaps assist you materially in disposing of the case, if we at first lay out of consideration those pleas about which there is now no controversy. The first plea that he uses is "not guilty," which we will reserve. Then, that the

Plaintiff was not the first and true inventor. The Plaintiff does not claim to have been the first discoverer, but to have been the person to whom that invention was communicated from abroad by a foreigner, which means, he did not acquire his information from any source of knowledge which was open to him in this country, but he derived it from a communication from a foreigner. Now there is no evidence at all to show that the Plaintiff derived his information from anybody else but a foreigner; and certainly there is a good deal of evidence from which you may conclude he did derive his information from a foreigner, namely, Mr. Babbitt, because Mr. Babbitt was over here in 1843, was permitted to try these boxes upon the Liverpool and Manchester line, and after that the patent was taken out. Now, though somebody else may have invented it also, although it may have been in use before, yet if the Plaintiff did not derive his information from the former use of it in this country, or from any person in this country, or from any source of information in this country, but in the manner specified, then he is, in the eye of the law, an inventor, and you may find him to be the first and true inventor, within the meaning of that plea.

Then the next issue is, that he did not enrol the specification; that is clearly proved.

Then, that he did not particularly describe the invention in his specification; that is clearly proved, because all the persons to whom the question was put say that a person of any competent skill in mechanics could work from the description given in the specification.

Then it is said that the invention is no improvement. For that purpose you must take the whole of the invention for which the patent was granted; there does not appear to be the least question on the evidence that it was a great improvement.

Then they say that the invention at the time of the patent was not a new manufacture, which others did not use, within the meaning of the statute. That makes it necessary that I should direct your attention to the statute under which these patents are granted. In the reign of James the First a Statute passed, making illegal all monopolies; but there was this reservation in the Statute, "That the declaration beforementioned shall not extend to letters patent and grants of privilege for the term of fourteen years next thereafter to be made, for selling, making, or working, any new manufacture within this realm, which others, at the time of making such letters patent and grant, shall not use." And, therefore, the meaning of this is, that that for which the patent was granted was not a new manufacture within this kingdom not used by other people.

Now with respect to this issue, you must take the whole of that for which the patent is granted, including the fillets within the outer case, as well as the lining with tin and the soft metal; and taking the whole of that together, it was not disputed, and as I understand was not intended to be disputed, that that was new until Mr. Hodge was called, and Mr. Hodge's evidence goes to prove that none of it is new, because Mr. Hodge proves that in 1829 he had a lathe down in Cornwall, which lathe had a step to hold a journal made of brass, which was first tinned, into which soft metal was then run, and which was retained in its position by fillets. And he says also that he made another—an experimental fir-cutting machine—in London also, I think about 1829, in which certain grooves were introduced, but it does not appear there were any fillets in that to retain the soft metal that was run into the grooves in that position. Perhaps therefore we may lay that out of consideration. Then he says in 1829 he made that lathe, and he used it for a time, then carried it to London and there used it for a time, and then sold it. What became of it we do not afterwards hear. It does not appear that any attempt has been made to trace it from 1829—for I think he went abroad to America in 1829—down to the present time. We do not hear of it, whether it was a mere experiment, whether any body else took notice of it so as to know anything about i or what became of it you do not hear; it is not all explained you. And although a person may hit upon a particular thi and try an experiment with reference to it, yet if that afterwards is laid by and abandoned, so that the public never gets the use of it, the person who afterwards invents and brings it into notice and use, may still have a patent for it, and I think Mr. Hodge's evidence was only evidence which went to negative the novelty for which the patent was granted, and upon which issue I think you are to consider the whole combination for which the patent was granted. Therefore that leaves for consideration the main question in the cause, have the Defendants pirated that or used any portion of that patent which has been granted to the Plaintiff.

Now if a patent is granted for a new combination of several things that have been known before, and he gets the patent for the whole thing so perfected, that does not prevent any one from using those parts which were known before—a combination of machinery for a particular purpose, may be known and in use up to a certain extent. An addition may be made to that which is quite new, and then the party may take out a patent for the whole machine composed of the old part, and these new parts, but such a patent would not prevent a person from using the old parts afterwards. It does not seem there is any evidence that the Defendants have used the whole combination—that is, they have not used the steps with the fillets for the purpose of retaining in them the soft metal when run in in a state of fusion.

Then let us see what the evidence is as to the extent to which they have used anything. I think we must take it upon the evidence now that they have taken new brasses for steps and bearings of their axles, new ones, and that they have first of all cleaned them and tinned them in the ordinary way by washing them with tin; that they have afterwards heated those brasses, and then by means of a stick of tin succeeded in laying on to them tin to the thickness of somewhere between a sixteenth or an eighth of an inch. That was the description given by the witnesses yesterday, and as they vouched the Company's servants for knowing that and having done that, and as you have no evidence to contradict it in the slightest degree, and the Company might have brought those servants here if they could have contradicted it, I think you may fairly take it to be true to the extent to which those witnesses stated it to you—you may fairly assume there was no exaggeration or mistake in the evidence which they gave.

With respect to their being new brasses and not merely patching of the old, certainly one of the witnesses spoke distinctly to two engines which had had the new brasses applied, prepared in this manner by people whom he named, and those people might have been brought here by this morning, if the Company had had it in their power by them to contradict what was sworn; therefore they cannot be taken by surprise on that subject. The Court broke up a long time before the mail train leaves in the evening: they might have been back here in very good time to give evidence before you.

The question then would come to this, whether that is an adoption substantially of any portion of that for which the Plaintiff obtained his patent, and whether that portion of the patent-right is new; therefore it will be, whether they have by that process of washing with tin, and afterwards rubbing the tin on, and, if necessary, smoothing it with a soldering iron, obtained that benefit which, the evidence shows, results from the Plaintiff's patent. Although they may not have obtained it to the same extent, or nearly to the same extent, yet if they have obtained some portion of the benefit, they are responsible, if as to that portion they could not prove that it was in use before the patent was granted.

Now that brings us to a consideration of the evidence in the cause. Now the first witness was Mr. Fothergill, foreman to Messrs. Sharpe, Brothers, and Company, who has been in their employ twenty-one years in all, and he represents them—possibly you may have the means of knowing whether he represents the truth or not—that they are persons very eminent in their line, and very extensively employed in the manufacture of locomotive engines, and other machinery, and he describes this as perfectly new to him; he says it was not used in their manufactory, that it was very essential to discover some mode of diminishing the abrasion and heat of these boxes, and that in their manufactory they knew nothing of this sort till the Plaintiff's invention came out. He says, he first heard of it in 1843, and he describes the extent to which the working of the engines without repair has been increased since that was introduced. There can be not the least doubt about its utility—no doubt about that. Then he is cross-examined about the introduction of tin into bearings, and he says, I have known tin introduced into bearings in cases of expediency; he said, I mean where the bearings of the shaft had been much worn, and it has been necessary to repair it during the night, because we had to work again in the morning, and it has been found the shaft could not be got out to put a new brass in by the morning, the workmen have lifted the shaft, poured in some melted block-tin or lead, and let that be under the shaft, so as to make a new bed for it, and that has remained in use till we have had the opportunity of substituting a new brass. Well then he says, sometimes when they have not fitted well, that we have used solid block-tin steps, and those did not answer. It appears they were sent over to Ireland—some half dozen. One witness proves he saw them in operation, and I think superintended them—they did not answer. You cannot say a block-tin step is the same thing as a tinned step, you will have no difficulty probably about that.

Then Mr. Fairbairn, an engineer at Manchester, also tells you that this was to him perfectly new—that he never had seen it in use before—that he had never used it; but that he had used block-tin steps, and alloys of tin, but they were always solid—never merely a coating of that material within the hard brasses or metal steps. He says, I think the novelty consists in having the outer case of a hard metal and running in the alloy as a lining, and applying it in locomotives to the journals of axles and shafts. He says, I have known before alloy would prevent heat in revolving substances; but he certainly never knew of any such application as that which is mentioned in the patent. Then Mr. Robert Stephenson, a gentleman very well known and very largely concerned in all branches of engineering, and very well, acquainted particularly with locomotive engines, says that he has seen it, and he thinks that if the lining were thin, the extension by pressure would not take place;

and he says, I consider fillets useful when the thickness of tin is considerable, and the thickness of tin is important, because it makes them last longer.

Then Mr. Wilkinson, who is the foreman of Bolton and Watt, says, he has been forty-three years in their service, fitting up engines and so forth, and to him the lining of steps and bearings with tin or an alloy of tin is quite new.

Then John Jones, who is the managing partner of the Viaduct Foundry, gives you evidence to the same effect.

Then John Hicks, the proprietor of the Soho Works, at Bolton le Moors, says he is acquainted with linings of soft metal to bearings; that he never knew it till a year and a half ago; he is now building engines upon that plan; he is working on the plan of the patentee.

Then Mr. Bennett Woodcroft, consulting engineer of Manchester, says he does not know much about steps of locomotives, but a good deal about steps of other engines; and he never knew anything of this till the Plaintiff's patent came out.

Then Mr. Glasgow, an engineer of thirty-five years' standing, in the House of Galloway, Beaumont, and Glasgow, manufacturers, says that to him it was perfectly new; that tinning for the purpose of joining hard metal with soft was to him not new. He says that the tinning is new and running them together is new; but tinning metal first for the purpose of soldering on other metal is not new, at least, to his knowledge.

Then we have Michael Allison, an important witness, the out-of-door foreman of the Liverpool and Manchester Railway Company, and he has been in their employment five years and a half; he speaks of the performance of this upon the three engines to which it was applied. That goes rather to the utility. I shall come back to his evidence with respect to the user of this by the Company.

So also of Benjamin Lewis. Then we have Mr. Edward M'Connell, engineer to the Birmingham and Gloucester Railway Company. He says they have adopted the patent, and he is cross-examined to this, to show that he had known of such a user of the soft lining before, and Mr. M'Connell says, I remember, in Gurwood's manufactory at Glasgow, some brasses of a circular saw got heated, then we put in a tin lining that was washed on in the usual way. The mere washing of tin is not claimed in this case; the washing of tin probably would not be considered as an evasion of it. That, however, I shall leave to you, but it does not arise in the present case. Certainly this evidence of Gurwood's manufactory, I think you will of opinion, falls short of that which the company have done in this respect.

Then we have Nicholas Adamson—he was only an engine-driver.

Then Mr. Benjamin Cubitt, who is very extensively engaged as an engineer, says that he has not known of soft metal introduced into bearings by fusion. He says, I have been conversant with mills and engines for a good while. He was in Fenton and Murray's for nine years, and that was a very great house for machinery.

Then Archibald Sturrock, the manager of the works on the Great Western Railway, says, the patent lining is used there, that they never used it before, and Mr. Fernihough, who is superintendent of the locomotive department of the Eastern Counties railway, says, they have introduced the patent, and he thinks it decidedly new, and he thinks the introduction of it with fillets is a great improvement, and that it would not answer well without it. He says without that you could not make the soft metal thick enough to make it worth while to use it.

Then Mr. Melling, an engine-builder at Rain Hill tells you that on the Grand Junction Railway in 1840, none of these tin linings had been introduced.

That is the evidence on the part of the Plaintiff as to the novelty of this invention. All these eminent engineers tell you that the introduction of this soft metal lining for brasses or bearings was to them perfectly new until this came out. The only exception to that in their evidence is the evidence of Mr. M'Connell, who says that in a Glasgow manufactory, the washing of tin was used to the brasses of a circular saw which got heated. In answer to that, it is very remarkable that they do not call any one engineer or engine-maker except Mr. Hodge, not one. They call Mr. Radcliffe, who is an artizan, who is employed by Messrs. Bower and company, of Nantwich, cotton spinners, to superintend their machinery and repair it, and he tells you that when our brasses had worn away, I frequently repaired them by pouring in melted tin, in order to fill up the space, so as to make them fit again —he patched the brasses in that way.

Now Joseph Heskith, in the employ of the Defendants at Crewe, is an engineer. He tells you he was formerly in the employ of Messrs. Bower, of Nantwich, as assistant in repairing these machines, and he tells you he had assisted the first witness Radcliffe in repairing the brasses in the manner he described.

Then comes a witness of the name of Parkinson, and he tells you when he was a boy of about fifteen or sixteen years old, his father worked at Parkinson's at Bury, and he worked there, and he said that they had journals of different sizes to use, and that the brasses were only of two or three sizes, and when they wanted to introduce a journal that did not fit the brasses, they then poured in liquid tin for the purpose of making it fit, and he described the manner in which that was done; that it was done by introducing a sort of sand mandril—he said the mandril was made of sand;—it must have been some adhesive matter to make it stick together: then the whole thing was put into a mould of sand, and the tin was run in. You recollect he described that very minutely. He was then cross-examined a good deal about what he has been doing, and the places he has been to since, and about his having taken a very active part to get witnesses in this cause. It did appear he had been employed in that capacity, and gone about obtaining information, and getting witnesses.

Then we have Thomas Barlow, an older person, who was in the employ of Parkinson, who saw the brasses repaired by soldering on the tin, but although he was in the manufactory at that time, he never saw any made in the manner that the former witness had described.

Then William Mason, a tin plate worker at Manchester, now at Marsh and Shears, and who was formerly a tin plate worker, who has employed himself in making pots and tins at Oldham, was there for some four or five years. He said the people from the mills brought him the brasses when they wanted them repaired, and got him to solder some tin on. I did it. He described the mode of repairing the brasses for them when they were worn away.

Then James Wilde, in the employ of Messrs. Broadbent, cotton-spinners, at Oldham, says they had used steps lined with tin six or seven years; they got them repaired in this way, and it was the man Mason who repaired them—therefore that leaves the case just as it was upon Mason's evidence.

Then you have Joseph Clark, who was in the employ of the Manchester and Leeds Railway Company. He proves that in 1824, twenty-one years ago, he bought different parts of a lathe, and because the brasses were too wide and would not fit the journals—he says I got them at different places and put them together—he melted in some soft metal in order to fill up the spaces. It appears he used that in his own room for a considerable time for his own improvement; he says he sold it in 1841. Some of his comrades saw the lathe.

Then we have the evidence of Mr. Hodge. He tells you of his having first made that fir-cutting machine in 1829, some experimental bearings—that does appear to have been an experiment—then the brasses were cut in longitudinal grooves and some soft metal run into it—block-tin. Then he spoke to having made that other in Cornwall, and then he tells you this, that in 1829, down in Cornwall, the lathes for turning iron in different manufactories were commonly made with brasses of this description—with brasses lined with softer metal, as described. That is in 1829. Mr. Hodge then went to America, and has remained there until within six or seven months, with the exception of a trip to England in the Autumn of 1843. Now, if they were in common use in Cornwall at that time, though not known to any of the eminent engineers in this part of the country, they were not new when this patent was taken out. Whether Mr. Hodge accurately recollects what was going on in Cornwall, whether you think he may be somewhat mistaken about it, speaking from his recollection of so long a time ago, whether you think that is more probable than that such brasses so prepared for the purpose of preventing friction, which he says was the case, was not known to any of the eminent engineers who have been called from different parts of the kingdom—whether it is more probable he was mistaken in his memory than that all the other gentlemen should have remained ignorant of the fact,—is for your consideration; but, certainly, he does describe brasses prepared and lined according to that mode very much according to the patent principle for which this patent was granted, if Mr. Hodge is correct. Then if you think Mr. Hodge is correct, and these things were used at that time in Cornwall, then, undoubtedly, the Plaintiff's patent must fail; or, if you think this patching of brasses spoken to by these people who have been employed as artizans in repairing the machinery of mills, though not in making,—if you think that that is substantially the same thing as that which the Plaintiff has made, independent of the fillets, then also that the Defendant would not have been guilty of violating that part of the patent; because, as I said before, the whole patent consists of the fillets, and of this metal run and fused into the brasses. The fillet has not been pirated. What has been pirated is the lining with tin, not by putting it on in a state of fusion, but by rubbing it on with a stick when the brass is hot, therefore only a partial fusion takes place when it adhered. Still however it was applied: if it was new in substance and effect it would be an evasion of the Plaintiff's patent. But if you think the patching in the manner in which it has been applied, in repairing old steps, was substantially the same thing as lining new ones, then the Plaintiff could not say that the Defendants had pirated that part of his patent, because then it would be no piracy to use that which had been known before.

With this direction you will be pleased to say whether you find those other issues—the two issues upon which you will have to decide will be, whether this was a new manufacture, taking it with the fillets altogether. If it was new, then the Plaintiff will be entitled to a verdict upon that issue. Then if it was new, whether you think that part used by the Defendants according to the evidence, namely, the washing it with tin and putting upon it the other tin in the manner described—whether that is substantially the same thing as the patching before or not, because if it was the same thing as the evidence of the parties, patching of the old machinery, then there would be an end of the case on that ground, because there would be no piracy. If, on the other hand, you think it was not the same thing, and the whole patent was new, then this would be a piracy of a part, and the Plaintiff would be entitled to your verdict.

Then, as to the damages they are to have, it is difficult to make out to what extent that has gone. It appears, some time ago—I think about six months after the patent was first taken out in 1843—they began to tin some of their brasses: that has gone on by degrees progressing down to the present time; and as they have the account of that, and have not shown to what extent they have used this, whether it be an infringement of the patent or not, you must make the best guess you can as to the compensation they ought to make to the Plaintiff for violating his patent.

At twenty-seven minutes past twelve, the Jury considered of their verdict.

The Foreman.—My Lord, we wish to retire.

At half-past twelve the Jury retired.—At nine minutes past one the Jury came into court.

The Associate.—Gentlemen, are you agreed upon your verdict?

The Foreman.—We are.

The Associate.—Do you find for the Plaintiff or for the Defendant?

The Foreman.—Verdict for the Plaintiff.

The Associate.—What Damages?

The Foreman.—Damages, £1,000.

Mr. Martin.—Will your Lordship certify under the Statute of the 5th and 6th William the Fourth?

Mr. Justice Cresswell.—Yes.

Mr. Martin.—As it is our special jury, your Lordship will also certify for a Special Jury?

Mr. Justice Cresswell.—Yes.

THE ONTARIO REPOSITORY,

CANANDAIGNA,

WEDNESDAY, JULY 2nd, 1845.

IMPORTANT CASE.

Among the causes tried at the recent term of the circuit court of the United States, in this village, which commenced on the 17th ult., was the case of Isaac Babbitt v. The Buffalo Steam Engine Works, for an infringement by the Defendants, of a patent obtained by the Plaintiff in 1839, for a new and useful improvement in the mode of making boxes for axles and gudgeons.

The Plaintiff, after giving in evidence his patent, proved by several witnesses, who were engineers, and acquainted with the Plaintiff's invention, that the boxes invented by him were of great utility, and almost indispensable to all revolving or sliding motions, in all kinds of machinery where great weight or speed are applied.

The Plaintiff also proved that the Defendants in the summer of 1843, and spring of 1844, had supplied several steam boats on lake Erie with those boxes, which boats had before then used the ordinary brass box. That these boxes required but very little oil, not one-third the amount required by the ordinary boxes, and reduced the friction so much, that nothing was to be apprehended from the heat necessarily produced by the use of the ordinary boxes.

The Jury, after a short but clear and perspicuous charge by His Honour Judge Conkling, returned a verdict for the Plaintiff, with 4,500 dollars damages.

Printed by R. Kinder, Green Arbour Court, Old Bailey.

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NOTES

OF THE CAUSE

TRIED AT THE LIVERPOOL SUMMER ASSIZES,

BEFORE

MR. JUSTICE CRESSWELL AND A SPECIAL JURY,

AUGUST 27TH, 1845,

BETWEEN

W. E. NEWTON

AND THE

GRAND JUNCTION RAILWAY COMPANY,

FOR AN INFRINGEMENT OF LETTERS PATENT
FOR IMPROVEMENTS IN THE CONSTRUCTION OF BOXES FOR THE
AXLETREES OF LOCOMOTIVE ENGINES AND CARRIAGES,
AND FOR
THE BEARINGS OR JOURNALS OF MACHINERY IN GENERAL;
AND ALSO
FOR IMPROVEMENTS IN OILING OR LUBRICATING
THE SAME.

LONDON:
SMITH, ELDER AND Co., 65, CORNHILL.
1845.

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